Access DB# 551

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: James R. Brittain Examiner# : 62846 Date: 5/3/02

Art Unit: 3677 Phone Number: 308-2222 Serial Number: 09/601,540

Mail Box and Bldg/Room Location: CPK 5-2D18 & after 5/6/02 Results Format Preferred (circle): Paper Disk E-mail

If more than one search is submitted, please prioritize searches in order of need.

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Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc., if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: ~~Nano~~ Micro-Fastening System Method of Manufacture

Inventors (please provide full names): David Tomanek; Richard Enbody; Young-Kyun Kwon

Earliest Priority Filing Date: ~~2/11/99~~ 2/12/98

**For Sequence Searches Only* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

Basically, Nanotube - ~~[illegible]~~ hook & loop material; Velcro-like.

loops, hooks, spirals made from nanotubes & form a fastening system so as to ~~form~~ fasten with a mating device.

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STAFF USE ONLY		Type of search		Vendors and cost where applicable	
Searcher:	Tamie Pole	NA Sequence (#)		STN	
Searcher Phone:	306-5967	AA Sequence (#)		Dialog	
Searcher Location:	804	Structure (#)		Questel/Orbit	
Date Searcher Picked Up:	5/6/2002	Bibliographic	X	Dr. Link	
Date Completed:	5/6/2002	Litigation		Lexis/Nexis	
Searcher Prep & Review Time:	125	Full Text	X	Sequence System	
Clerical Prep Time:		Patent Family		WWW/Internet	
Online Time:	200	Other		Other (specify)	IEEE

File 344:CHINESE PATENTS ABS APR 1985-2002/MAR
(c) 2002 EUROPEAN PATENT OFFICE
File 347:JAPIO Oct/1976-2001/Dec(Updated 020401)
(c) 2002 JPO & JAPIO
File 350:Derwent WPIX 1963-2001/UD,UM &UP=200228
(c) 2002 Thomson Derwent
File 371:French Patents 1961-2002/BOPI 200209
(c) 2002 INPI. All rts. reserv.

Set	Items	Description
S1	516	NANOTUBE?
S2	326	MULTI()WALL? ? OR MULTIWALL? OR MULTI-WALL? ?
S3	3	MICROFASTEN? OR MICRO()FASTEN? OR MICRO-FASTEN?
S4	233977	FASTEN?
S5	13091	HOOK? ? AND LOOP? ?
S6	3380	VELCRO?
S7	124264	SPIRAL?
S8	625113	DEFORM? OR BEND OR BENDS OR BENDAB? OR BENDING OR BENT
S9	22011	NON()LINEAR OR NON-LINEAR
S10	1572655	METALS OR CARBON OR SILICON OR GERMANIUM OR POLYMERS
S11	82	REUSAB?(3N)FASTENER?
S12	42315	MATING
S13	605	MICROTUB? OR MICRO()(TUBE? OR TUBULAR)
S14	0	NANOVELCRO? OR NANO-VELCRO? OR NANO()VELCRO?
S15	0	NANOSCALE AND (FASTENING OR FASTENER?)
S16	14	S1 AND S2
S17	14	S16 AND (S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR - S11 OR S12)
S18	1	S1 AND S3
S19	0	S18 NOT S17
S20	2	S1 AND S12
S21	1	S20 NOT S17
S22	1	S1 AND (S5 OR S6)
S23	0	S22 NOT (S17 OR S20)
S24	1	S1 AND S4
S25	0	S24 NOT (S17 OR S20)
S26	0	S13 AND S12
S27	10	S13 AND (S2 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9)
S28	10	S27 NOT (S17 OR S20)
S29	2999	(S3 OR S4) AND S12
S30	265	S29 AND (S5 OR S6)
S31	17	S30 AND (S7 OR S8 OR S9 OR S11)
S32	16	S31 NOT (S17 OR S20 OR S27)
S33	3	AU="TOMANEK D"
S34	2	AU="ENBODY R"
S35	34	AU="KWON Y K"
S36	3	(S33 OR S34 OR S35) AND (S1 OR S2 OR S3 OR S4 OR S5 OR S6 - OR S11 OR S13)
S37	2	S36 NOT (S17 OR S20 OR S27 OR SS31)

17/5/1 **(Item 1 from file: 350)**
DIALOG(R)File 350:Derwent WPIX

014359190 **Image available**
WPI Acc No: 2002-179891/200223
XRAM Acc No: C02-055965
XRPX Acc No: N02-136735

Formation of telescoped nanotube **comprises attaching end of outer shell of** multiwall nanotube **to conductive substrate, attaching nanomanipulator to inner core, and partially extracting inner core**

Patent Assignee: BERKELEY NAT LAB LAWRENCE (BERK-N)
Inventor: COHEN M L; CUMINGS J P; LOUIE S G; ZETTL A K
Number of Countries: 095 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 200208120	A2	20020131	WO 2001US23354	A	20010724	200223	B

Priority Applications (No Type Date): US 2000220550 P 20000725
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 200208120	A2	E	26	C01B-031/02	

Designated States (National): AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
Designated States (Regional): AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW

Abstract (Basic): WO 200208120 A2

NOVELTY - A telescoped **nanotube** is formed by attaching a first end of an outer shell of a **multiwall nanotube** to a conductive substrate; removing a second end of an outermost and concentric inner shells, revealing an inner core; attaching a nanomanipulator to the second end of the inner core; and partially extracting the inner core from the outer shell and the concentric inner shells.

DETAILED DESCRIPTION - Formation of a telescoped **nanotube** comprises:

(a) providing a **multiwall nanotube** comprising an outer shell, concentric inner shells, and an inner core, each having a first end and a second end in opposition;

(b) attaching the first end of the outer shell to a conductive substrate so as to be in electrical communication;

(c) removing the second end of the outermost shell and of the concentric inner shells, revealing the second end of the inner core;

(d) attaching a nanomanipulator to the second end of the inner core, to partially extract the inner core from the outer shell; and

(e) partially extracting the inner core from the outer shell and the concentric inner shells, to telescope one segment of the **multiwall nanotube** .

An INDEPENDENT CLAIM is also included for a device comprising a telescoped **multiwall nanotube** comprising:

(i) an outer shell having a cylindrical wall, a closed end, and an interior cavity defined by the cylindrical wall and the closed end; and

(ii) a telescoped segment partially housed within the interior cavity of the outer shell and partially extending from the outermost shell, where the telescoped segment has a cylindrical segment wall, a closed segment end, and a segment cavity.

USE - For forming a telescoped **nanotube** useful for producing a device that is used for a bearing, a switch, or a resistance potentiometer (claimed).

ADVANTAGE - The method forms a telescoped **nanotube** that may find utility as a low-friction bearing or constant force spring.

DESCRIPTION OF DRAWING(S) - The figure illustrate the method and several manipulations made of the telescoped **multiwall nanotube** produced.

pp; 26 DwgNo 1/4

Title Terms: FORMATION; TELESCOPE; COMPRISE; ATTACH; END; OUTER; SHELL; **MULTIWALL** ; CONDUCTING; SUBSTRATE; ATTACH; INNER; CORE; EXTRACT; INNER; CORE

Derwent Class: E37; L02; L03; S02; U11; U12; V01; V03

International Patent Class (Main): C01B-031/02

International Patent Class (Additional): C01G-023/047; C01G-053/11

File Segment: CPI; EPI

17/5/2 (Item 2 from file: 350)

DIALOG(R)File 350:Derwent WPIX

014358231

WPI Acc No: 2002-178932/200223

XRAM Acc No: C02-055421

Augmented synthetic resin, is suitable for use as bone cement or dental restoration, comprises carbon nanotubes **dispersed in polymethylmethacrylate matrix**

Patent Assignee: ANDREWS R J (ANDR-I); PIENKOWSKI D A (PIEN-I)

Inventor: ANDREWS R J; PIENKOWSKI D A

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 20020001620	A1	20020103	US 2000179569	P	20000201	200223	B
			US 2001773293	A	20010131		

Priority Applications (No Type Date): US 2000179569 P 20000201; US 2001773293 A 20010131

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 20020001620	A1		6	A61K-009/14	Provisional application US 2000179569

Abstract (Basic): US 20020001620 A1

NOVELTY - Augmented synthetic resin, comprises **carbon nanotubes** dispersed in polymethylmethacrylate matrix.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are included for a dental restoration constructed from the resin and a method of preparing the resin comprising mixing **carbon nanotubes** in a methylmethacrylate monomer; disaggregating the **carbon nanotubes** ; adding polymethylmethacrylate polymer to the mixture; and vacuum mixing.

USE - The resin is suitable for use as bone cement, dental restoration or other type of dental or medical prosthesis.

ADVANTAGE - The presence of the **carbon nanotubes** inhibits shrinkage of the resin during curing which leads to better fit and load transfer of the prosthesis.

pp; 6 DwgNo 0/0

Title Terms: AUGMENT; SYNTHETIC; RESIN; SUIT; BONE; CEMENT; DENTAL; RESTORATION; COMPRISE; **CARBON** ; DISPERSE; MATRIX

Derwent Class: A96; D21; D22; E36

International Patent Class (Main): A61K-009/14

International Patent Class (Additional): A61K-033/44

File Segment: CPI

17/5/3 (Item 3 from file: 350)

DIALOG(R)File 350:Derwent WPIX

014311424
WPI Acc No: 2002-132126/200218
XRAM Acc No: C02-040669
XRPX Acc No: N02-099677

Growing carbon nanotubes **perpendicularly on a (non-)flat surface involves plasma enhanced chemical vapor deposition on a substrate with a metal catalyst layer**

Patent Assignee: LUCENT TECHNOLOGIES INC (LUCE)
Inventor: BOWER C A; JIN S; ZHU W
Number of Countries: 029 Number of Patents: 005
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
EP 1129990	A1	20010905	EP 2000307617	A	20000904	200218	B
AU 200123085	A	20010830	AU 200123085	A	20010216	200218	
CA 2331278	A1	20010825	CA 2331278	A	20010117	200218	
JP 2001262343	A	20010926	JP 200145300	A	20010221	200218	
KR 2001085509	A	20010907	KR 20019179	A	20010223	200218	

Priority Applications (No Type Date): US 2000512873 A 20000225
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
EP 1129990	A1	E	18	C01B-031/02	

Designated States (Regional): AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
AU 200123085	A			C23C-016/26	
CA 2331278	A1	E		C01B-031/02	
JP 2001262343	A		10	C23C-016/26	
KR 2001085509	A			C01B-031/02	

Abstract (Basic): EP 1129990 A1

NOVELTY - Process for fabricating an article in which **nanotubes** are aligned perpendicular to the substrate surface comprises:

(i) providing a substrate having a (non-)flat surface and a metal catalyst layer; and

(ii) forming **carbon nanotubes** on the metal catalyst layer by a plasma enhanced chemical vapor deposition (PECVD) process with a gaseous **carbon** -based chemistry.

USE - The **carbon nanotubes** are useful in a variety of nanometer-scale devices and technologies.

ADVANTAGE - The process allows **nanotubes** to be grown on a (non-)flat surface with an average deviation from the perpendicular of less than 15 degrees. Their diameter, length and location can also be controlled.

pp; 18 DwgNo 0/7

Title Terms: GROW; **CARBON** ; PERPENDICULAR; NON; FLAT; SURFACE; PLASMA; ENHANCE; CHEMICAL; DEPOSIT; SUBSTRATE; METAL; CATALYST; LAYER
Derwent Class: E36; L02; L03; P73; U11; V05; X14
International Patent Class (Main): C01B-031/02; C23C-016/26
International Patent Class (Additional): B01J-035/02; B01J-037/02; B32B-005/08; H01J-009/02
File Segment: CPI; EPI; EngPI

17/5/4 (Item 4 from file: 350)
DIALOG(R)File 350:Derwent WPIX

014268899 **Image available**
WPI Acc No: 2002-089597/200212
Related WPI Acc No: 2001-626511; 2001-639396
XRAM Acc No: C02-027538
XRPX Acc No: N02-066067

Power cable used to supply electricity for e.g. high frequency

applications and signal transmissions within communication fields, comprises conductor(s) having nanostructures arranged in matrix
Patent Assignee: ABB AB (ALLM)
Inventor: HJORTSTAM O; ISBERG P; KORSKE H; SOEDERHOLM S
Number of Countries: 094 Number of Patents: 004
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 200175902	A1	20011011	WO 2001SE696	A	20010330	200212	B
SE 200001123	A	20011001	SE 20001123	A	20000330	200212	
SE 200003944	A	20011001	SE 20003944	A	20001030	200212	
AU 200144970	A	20011015	AU 200144970	A	20010330	200214	

Priority Applications (No Type Date): SE 20001123 A 20000330
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 200175902	A1	E	29	H01B-001/04	

Designated States (National): AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
Designated States (Regional): AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
SE 200001123	A			H01B-001/14	
SE 200003944	A			H01B-001/04	
AU 200144970	A			H01B-001/04	Based on patent WO 200175902

Abstract (Basic): WO 200175902 A1

NOVELTY - A power cable (1) comprises one or more conductors (10) surrounded by insulation material (12). At least one of the conductor contains nanostructures, which are arranged in a matrix.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for a method for producing a power cable comprising embedding nanostructures in a matrix; forming the material into a conductor; and surrounding the conductor with insulation material.

USE - The invention is used to supply electricity, for direct/alternating current transmission, for high frequency applications, used to supply electricity to machines and for signal transmission within communications field (all claimed).

ADVANTAGE - Has low conduction losses and is able to carry high current densities. The risk of cavities and pores in the cable's insulation system which can lead to partial discharges at high fields strengths is minimized or even eliminated. It has high mechanical strength, high heat-and-cold resistance, environmentally friendly and easy to recycle.

DESCRIPTION OF DRAWING(S) - The drawing shows a three-dimensional view of a power cable.

conductors (10)
insulation (12)
pp; 29 DwgNo 1/4

Title Terms: POWER; CABLE; SUPPLY; ELECTRIC; HIGH; FREQUENCY; APPLY; SIGNAL ; TRANSMISSION; COMMUNICATE; FIELD; COMPRISE; CONDUCTOR; ARRANGE; MATRIX
Derwent Class: A14; A17; A32; A85; E36; L03; X12
International Patent Class (Main): H01B-001/04; H01B-001/14
International Patent Class (Additional): C01B-031/02; H01B-007/00; H01B-011/00; H01B-012/00; H01L-039/12
File Segment: CPI; EPI

17/5/5 (Item 5 from file: 350)
DIALOG(R)File 350:Derwent WPIX

014155169 **Image available**

WPI Acc No: 2001-639396/200173
Related WPI Acc No: 2001-626511
XRAM Acc No: C01-189213
XRPX Acc No: N01-477893

Induction winding for, e.g. static electric machine, comprises current-carrying mechanism comprising nanostructures

Patent Assignee: ABB AB (ALLM)
Inventor: HJORTSTAM O; ISBERG P; SOEDERHOLM S
Number of Countries: 094 Number of Patents: 002
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 200175912	A1	20011011	WO 2001SE697	A	20010330	200173	B
AU 200144971	A	20011015	AU 200144971	A	20010330	200209	

Priority Applications (No Type Date): SE 20001748 A 20000512; SE 20001123 A 20000330
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 200175912	A1	E	22	H01F-027/28	

Designated States (National): AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
Designated States (Regional): AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
AU 200144971	A			H01F-027/28	Based on patent WO 200175912

Abstract (Basic): WO 200175912 A1

NOVELTY - An induction winding 1, 2, 3, 4 comprises current-carrying mechanism comprising nanostructures.

USE - For static (e.g. transformer) or rotary electric machine (e.g. DC motor) for electric energy generation, transmission, distribution, conversion or consumption (claimed). The induction winding is useful for induction devices with or without a core.

ADVANTAGE - The inventive induction winding is capable of conducting large currents with low conduction losses, i.e. low resistance and low eddy current losses. It is a strong, flexible current-carrying and compact mechanism, which minimizes risks for partial discharges caused by the presence of cavities and pores in the insulation system around the current-carrying mechanism. It is useful at low (0-1 kV), medium (1-34 kV), and high voltages (34 kV) for small (mA) as well as high large currents (1A and higher), and it eliminates the need for a cooling system in an induction device.

DESCRIPTION OF DRAWING(S) - The figure shows a three dimensional view of an induction winding containing current-carrying mechanism comprising individual nanostructures dispersed in a matrix.

Current carrying mechanisms (10)
Semiconducting layer (11)
Insulation material (12)
Outer semiconducting layer (13)
pp; 22 DwgNo 1/4

Title Terms: INDUCTION; WIND; STATIC; ELECTRIC; MACHINE; COMPRISE; CURRENT; CARRY; MECHANISM; COMPRISE
Derwent Class: A85; L03; X11; X12
International Patent Class (Main): H01F-027/28
International Patent Class (Additional): H02K-003/02
File Segment: CPI; EPI

17/5/6 (Item 6 from file: 350)
DIALOG(R)File 350:Derwent WPIX

014142300 **Image available**
WPI Acc No: 2001-626511/200172
Related WPI Acc No: 2001-639396; 2002-089597
XRAM Acc No: C01-186742
XRPX Acc No: N01-466991

Electric conductor includes conducting material comprising charge-transfer agent that is able to transfer charge between itself and nanostructures, and that is adapted to shift nanostructures' fermi level

Patent Assignee: ABB AB (ALLM)
Inventor: HJORTSTAM O; ISBERG P
Number of Countries: 094 Number of Patents: 002
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 200175903	A1	20011011	WO 2001SE698	A	20010330	200172	B
AU 200144972	A	20011015	AU 200144972	A	20010330	200209	

Priority Applications (No Type Date): SE 20003944 A 20001030; SE 20001123 A 20000330
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 200175903	A1	E	22	H01B-001/04	

Designated States (National): AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
Designated States (Regional): AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
AU 200144972	A			H01B-001/04	Based on patent WO 200175903

Abstract (Basic): WO 200175903 A1

NOVELTY - An electric conductor comprises a conducting material containing nanostructures and a charge-transfer agent (31) that is able to transfer charge between itself and the nanostructures, and that is adapted to shift the nanostructures' fermi level so that they attain an enhanced conductivity.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for a method of producing conducting material containing nanostructures that are treated by reaction with a fluid containing a charge-transfer agent.

USE - For supplying electricity, quantum wire, DC or AC transmission, or signal transmission within communications field (claimed).

ADVANTAGE - The invention produces nanostructured-based conducting material with enhanced electric conductivity. The application of charge-transfer agent to conducting material containing nanopores or nanofibers separates individual **nanotubes** , which decreases their interaction and the bandgap that arises because of the interaction.

DESCRIPTION OF DRAWING(S) - The figure shows a power cable comprising conducting material containing nanostructures.

Charge-transfer agent (31)

pp; 22 DwgNo 3/3

Title Terms: ELECTRIC; CONDUCTOR; CONDUCTING; MATERIAL; COMPRISE; CHARGE; TRANSFER; AGENT; ABLE; TRANSFER; CHARGE; ADAPT; SHIFT; FERMI; LEVEL
Derwent Class: A85; L03; M22; X12
International Patent Class (Main): H01B-001/04
International Patent Class (Additional): C01B-031/02
File Segment: CPI; EPI

17/5/7 (Item 7 from file: 350)
DIALOG(R)File 350:Derwent WPIX

013897113 **Image available**
WPI Acc No: 2001-381326/200140
XRAM Acc No: C01-116799
XRPX Acc No: N01-279612

Fabrication of nanogaps on electrode by depositing carbon nanotube **(s) on first resist layer, coating second resist layer, forming trilayer component, forming pattern and depositing metal layer, and dissolving resist and** nanotube

Patent Assignee: UNIV PENNSYLVANIA (UYPE-N)
Inventor: JOHNSON A T; LEFEBVRE J; RADOSAVLJEVIC M
Number of Countries: 023 Number of Patents: 002
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 200139292	A2	20010531	WO 2000US42312	A	20001129	200140	B
AU 200139704	A	20010604	AU 200139704	A	20001129	200153	

Priority Applications (No Type Date): US 99167851 P 19991129
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 200139292	A2	E	16	H01M-000/00	
AU 200139704	A			H01M-000/00	Based on patent WO 200139292

Designated States (National) (WO 200139292): AU CA JP US
Designated States (Regional) (WO 200139292): AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR

Abstract (Basic): WO 200139292 A2

NOVELTY - Nanogaps are formed on an electrode by depositing **carbon nanotube** (s) on a first resist layer, and coating a second resist layer to form a trilayer component. A pattern is formed in the resist layers, and a metal layer is deposited into the substrate at a recess where **nanotube** shadows the substrate, creating a nanogap in the metal layer. The resist and the **nanotube** are then dissolved.

DETAILED DESCRIPTION - Fabrication of nanogaps on an electrode involves coating a first resist layer (2) into a substrate, depositing at least one **carbon nanotube** on the first resist layer, and coating a second resist layer (3) over the first resist layer and the **nanotube** forming a trilayer component. A pattern comprising a recess across which the **carbon nanotube** extends, is formed in the first and the second resist layers. A metal layer is deposited into the substrate at the recess where **nanotube** shadows the substrate, creating a nanogap (10) in the metal layer on the substrate. The resist and the **nanotube** are then dissolved to form the electrode comprising the substrate and the nanogap within the metal layer.

USE - Fabricating nanogaps on an electrode.

ADVANTAGE - Process simple, highly controllable and scaleable in producing nanogaps with sizes of 1-100 nm.

DESCRIPTION OF DRAWING(S) - The figure shows a perspective view of a tri-layer system with a portion of the resist layers cut away.

First resist layer (2)
Second resist layer (3)
Nanogap (10)
pp; 16 DwgNo 1/3

Title Terms: FABRICATE; ELECTRODE; DEPOSIT; **CARBON** ; FIRST; RESIST; LAYER; COATING; SECOND; RESIST; LAYER; FORMING; COMPONENT; FORMING; PATTERN; DEPOSIT; METAL; LAYER; DISSOLVE; RESIST
Derwent Class: A85; L03; U11; U12; V05
International Patent Class (Main): H01M-000/00
File Segment: CPI; EPI

17/5/8 (Item 8 from file: 350)
DIALOG(R)File 350:Derwent WPIX

013846178 **Image available**
WPI Acc No: 2001-330391/200135
XRAM Acc No: C01-101587
XRPX Acc No: N01-237890

Tactile sensor device for touch-sensitive controllers in computer-related and robotics products, has vertically aligned nanowires attached to contact pads on circuit substrate surface

Patent Assignee: LUCENT TECHNOLOGIES INC (LUCE); AGERE SYSTEMS GUARDIAN CORP (AGER-N)
Inventor: JIN S
Number of Countries: 027 Number of Patents: 003
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
EP 1087413	A2	20010328	EP 2000307853	A	20000911	200135	B
JP 2001153738	A	20010608	JP 2000287826	A	20000922	200138	
US 6286226	B1	20010911	US 99405641	A	19990924	200154	

Priority Applications (No Type Date): US 99405641 A 19990924
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
EP 1087413	A2	E	16	H01H-001/06	

Designated States (Regional): AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
JP 2001153738	A		11	G01L-005/00	
US 6286226	B1			G01B-021/00	

Abstract (Basic): EP 1087413 A2

NOVELTY - A tactile sensor device comprises an array of contact pads on a circuit substrate surface and a set of vertically aligned and equi-length nanowires attached to each contact pad. Upon tactile contact, the nanowires make physical and electrical contacts between them such that tactile shear or compression contact can be determined by electrical interrogation.

DETAILED DESCRIPTION - A tactile sensor device for detecting the position and movement activity of an object comprises a circuit substrate having a surface (18). An array of contact pads on the surface of the substrate has contact pads in the absence of a tactile activation electrically isolated from each other. A set of nanowires is attached to each contact pad (12). Each set of nanowires comprises vertically aligned and equi-length nanowires. When an object (20) contacts set(s) of nanowires (14a, 14b, 14c, 14d), it causes set(s) of nanowires to **bend** and make contact (15) along a portion of its length with at least another set. The position and movement activity of the object can be sensed by electrically interrogating contact pad(s) to determine whether a connection has been made between sets of nanowires.

USE - The device is useful in touch-sensitive controllers in computer-related and robotic products.

ADVANTAGE - The high-resolution tactile sensor device is simple, compact, and reliable.

DESCRIPTION OF DRAWING(S) - The drawing shows a cross-sectional side view of a sensor of the invention with an object laterally contacting the sensor.

contact pad (12)
sets of nanowires (14a,14b,14c,14d)
contact (15)
surface (18)
object (20)
pp; 16 DwgNo 1B/7

Title Terms: TACTILE; SENSE; DEVICE; TOUCH; SENSITIVE; CONTROL; COMPUTER; RELATED; ROBOT; PRODUCT; VERTICAL; ALIGN; ATTACH; CONTACT; PAD; CIRCUIT; SUBSTRATE; SURFACE

Derwent Class: L03; S02; V03; V04; X25
International Patent Class (Main): G01B-021/00; G01L-005/00; H01H-001/06
International Patent Class (Additional): G01B-007/00; G01P-013/00; G01P-013/02; G06F-003/03; H01H-001/00; H01H-003/16; H01L-029/84
File Segment: CPI; EPI

17/5/9 (Item 9 from file: 350)
DIALOG(R)File 350:Derwent WPIX

013759899 **Image available**
WPI Acc No: 2001-244111/200125
XRAM Acc No: C01-073146
XRPX Acc No: N01-173811
Oxidation of multiwalled carbon nanotubes **, useful e.g. in electrodes for electrochemical capacitors, involves treatment with a gas-phase oxidizing agent such as** carbon **dioxide, oxygen or steam**
Patent Assignee: HYPERION CATALYSIS INT INC (HYPE-N)
Inventor: CHISHTI A; HOCH R; MOY D; NIU C
Number of Countries: 093 Number of Patents: 002
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 200107694	A1	20010201	WO 2000US18670	A	20000707	200125	B
AU 200060787	A	20010213	AU 200060787	A	20000707	200128	

Priority Applications (No Type Date): US 99358745 A 19990721
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 200107694	A1	E	41	D01F-009/12	

Designated States (National): AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW
Designated States (Regional): AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TZ UG ZW

AU 200060787 A D01F-009/12 Based on patent WO 200107694

Abstract (Basic): WO 200107694 A1

NOVELTY - **Multiwalled carbon nanotubes** of diameter not more than 1 micron are oxidized by contact with a gas-phase oxidizing agent under conditions sufficient to form oxidized **nanotubes** .

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for:

(1) Production of a network of **carbon nanotubes** by:
(a) oxidizing the **nanotubes** as above and
(b) subjecting them to crosslinking conditions.
(2) Production of a network of **carbon nanotubes** by:
(a) oxidizing the **nanotubes** ,
(b) treating them with a reactant which adds secondary group(s) to the surface and
(c) contacting the groups with a crosslinking agent.
(3) Preparation of a rigid porous structure by:
(a) oxidizing a number of **nanotubes** ,
(b) dispersing them in a medium and
(c) separating a porous structure of entangled **nanotubes** .
(4) An electrochemical capacitor having electrode(s) comprising the **nanotubes** .

USE - The surface-oxidized **nanotubes** can be placed into matrices of other materials, e.g. plastics, or made into structures useful in catalysis, chromatography and filtration systems. They are particularly useful in electrodes for electrochemical capacitors (claimed).

ADVANTAGE - The oxidation process does not generate environmentally hazardous chemicals, and can be easily and inexpensively scaled up. The

capacitors exhibit enhanced characteristics such as specific capacitance.

DESCRIPTION OF DRAWING(S) - The figure shows a reactor suitable for oxidizing **nanotubes** .

pp; 41 DwgNo 1/6

Title Terms: OXIDATION; **MULTIWALL** ; **CARBON** ; USEFUL; ELECTRODE; ELECTROCHEMICAL; CAPACITOR; TREAT; GAS; PHASE; AGENT; **CARBON** ; OXYGEN; STEAM

Derwent Class: E36; F01; L02; L03; V01

International Patent Class (Main): D01F-009/12

File Segment: CPI; EPI

17/5/10 (Item 10 from file: 350)

DIALOG(R)File 350:Derwent WPIX

013214876 **Image available**

WPI Acc No: 2000-386750/200033

Related WPI Acc No: 2002-162649

XRAM Acc No: C00-117194

XRPX Acc No: N00-289552

Producing nanoscale tubes and particles for arc discharge techniques, comprises moving material through a conduit, cooling and applying a voltage between first and second electrodes sufficient to generate an arc

Patent Assignee: UNIV CALIFORNIA (REGC)

Inventor: COHEN M L; ZETTL A K

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 6063243	A	20000516	US 95388494	A	19950214	200033	B
			US 97978437	A	19971125		

Priority Applications (No Type Date): US 97978437 A 19971125; US 95388494 A 19950214

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 6063243	A		8	B01J-019/08	CIP of application US 95388494

Abstract (Basic): US 6063243 A

NOVELTY - Producing nanoscale tubes and particles comprises novel electrodes for use in arc discharge techniques, the electrodes having interior conduits for delivery and withdrawal of material from the arc region where product is formed.

DETAILED DESCRIPTION - A method for producing nanoscale tubes and particles comprises:

(a) providing an ambient environment in a vacuum chamber;

(b) providing first and second chambers in the chamber where the electrode(s) has an interior region comprising conduit(s), each conduit connecting a fluid source located outside the chamber to a coolant core inside the electrode, the coolant core having a drain through an exit conduit to the exterior of the chamber;

(c) moving material through a conduit in the first electrode;

(d) cooling the electrode(s) by circulating coolant through the cooling core; and

(e) applying a voltage between the first and second electrodes sufficient to generate an arc in an arc region to form the nano-scale particles or tubes from the material.

INDEPENDENT CLAIMS are also included for:

(1) the claimed method for producing the nano-scale tubes and particles comprising BN, BC2N and/or BC3 further comprising collecting a product formed in an arc region between the anode and the cathode and deposited on the electrodes;

(2) the nano-scale tubes and particles comprising a compound anode consisting of a rod of boron nitride.

USE - Used in electrical and structural components for computers, sensors, filters, micromachines, chip interconnects, ultra-small scale devices, cables and high strength mechanical fibers, and dry lubricants.

ADVANTAGE - Provides a reliable means for synthesizing miniature conducting particles and tubes.

DESCRIPTION OF DRAWING(S) - Figure 1 shows a schematic cross-sectional view of the apparatus.

chamber (10)
conduits (14)
source (16)
gas pressure gauge (18)
anode (20)
compound element (21)
electrodes (20, 22)
cathode (22)
arc region (23)
material reservoir (24)
electrical energy (26)
fluid supply (28)
exit port (14')
pp; 8 DwgNo 1/3

Title Terms: PRODUCE; TUBE; PARTICLE; ARC; DISCHARGE; TECHNIQUE; COMPRISE; MOVE; MATERIAL; THROUGH; CONDUIT; COOLING; APPLY; VOLTAGE; FIRST; SECOND; ELECTRODE; SUFFICIENT; GENERATE; ARC
Derwent Class: E36; F01; J04; L02; L03; V05
International Patent Class (Main): B01J-019/08
File Segment: CPI; EPI

17/5/11 (Item 11 from file: 350)
DIALOG(R)File 350:Derwent WPIX

013193643 **Image available**
WPI Acc No: 2000-365516/200031
XRAM Acc No: C00-110378

Production of single wall nanotubes **involves reacting a preheated high-pressure** carbon **monoxide gas stream with a gaseous catalyst precursor capable of supplying a transition metal**

Patent Assignee: UNIV RICE WILLIAM MARSH (UYRI-N)
Inventor: BRADLEY R K; BRONIKOWSKI M J; COLBERT D T; NIKOLAEV P; ROHMUND F; SMALLEY R E; SMITH K A
Number of Countries: 088 Number of Patents: 004
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 200026138	A1	20000511	WO 99US25702	A	19991103	200031	B
AU 200016033	A	20000522	AU 200016033	A	19991103	200040	
EP 1137593	A1	20011004	EP 99958736	A	19991103	200158	
			WO 99US25702	A	19991103		
KR 2001080933	A	20010825	KR 2001705565	A	20010503	200215	

Priority Applications (No Type Date): US 99161728 P 19991027; US 98106917 P 19981103; US 98114588 P 19981231; US 99117287 P 19990126
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 200026138	A1	E	46	C01B-031/02	

Designated States (National): AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG US UZ VN YU ZA ZW

Designated States (Regional): AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SL SZ TZ UG ZW

AU 200016033 A C01B-031/02 Based on patent WO 200026138

EP 1137593 A1 E C01B-031/02 Based on patent WO 200026138

Designated States (Regional): AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI

KR 2001080933 A C01B-031/02

Abstract (Basic): WO 200026138 A1

NOVELTY - Single wall **nanotubes** are produced by reacting a preheated high pressure **carbon** monoxide (CO) gas stream with a gaseous catalyst precursor capable of supplying a transition metal kept below the catalyst precursor decomposition temperature in a mixing zone.

DETAILED DESCRIPTION - Production of single wall **carbon** **nanotubes** comprises:

(a) providing a high pressure CO gas stream a gaseous catalyst precursor stream, which is capable of supplying atoms of a transition metal from Group VI and/or VIII, kept below the decomposition temperature of the catalyst precursor;

(b) preheating the CO stream at a temperature above the decomposition temperature of the catalyst precursor and the minimum Boudouard reaction initiation temperature;

(c) mixing the two streams to heat the catalyst precursor above its decomposition temperature, promote rapid formation of catalyst metal atom clusters, and initiate growth of single wall **nanotubes** to form a suspension of single wall **carbon** **nanotubes** in the resulting stream.

INDEPENDENT CLAIMS are also included for:

(a) an apparatus for producing the single wall **carbon** **nanotubes** comprising:

(i) a high pressure reaction vessel including an entrance zone, a mixing zone, a growth and annealing zone, and a product recovery zone;

(ii) two supply conduits for the gaseous catalyst;

(iii) mixers for the gas flows from the two supply conduits;

(iv) heaters for maintaining the growth and annealing zones at elevated temperatures; and

(v) gas/solid separators positioned in the recovery zone for removing the products from the exit streams, and for

(b) a composition of matter comprising a sidewall **carbon** **nanotubes** (SWNTs) having a diameter of 0.6-0.8 nm.

USE - For the production of single wall **nanotubes** of small diameter.

ADVANTAGE - The catalyst quickly grow a long single-wall **carbon** **nanotube** , and collisions between these particles are eliminated because all such collisions are dominated by tube-tube encounters. Further, iron (Fex clusters at the end of each tube are prevented from coming into frequent contact while remaining as live ends. **Nanotubes** formed are stronger, more conductive and are more useful than **multi** - **wall** **carbon** **nanotubes** of similar diameter.

DESCRIPTION OF DRAWING(S) - The drawing shows one EMBODIMENT of the overall process.

CO supply vessel (1)

filtration unit (2)

catalyst carrier (4)

catalyst supply vessel (6)

catalyst containing stream (7)

mixing zone (8)

pp; 46 DwgNo 1/8

Title Terms: PRODUCE; SINGLE; WALL; REACT; PREHEAT; HIGH; PRESSURE; **CARBON** ; GAS; STREAM; GAS; CATALYST; PRECURSOR; CAPABLE; SUPPLY; TRANSITION; METAL

Derwent Class: E36; J04; L02

International Patent Class (Main): C01B-031/02
International Patent Class (Additional): B01J-003/04
File Segment: CPI

17/5/12 (Item 12 from file: 350)
DIALOG(R)File 350:Derwent WPIX

013120934
WPI Acc No: 2000-292805/200025
XRAM Acc No: C00-088418

Production of single-wall carbon nanotubes **involves providing a metal catalyst supported in a reaction zone which is supplied with a gaseous** carbon **-containing compound and contacting the compound with catalyst particles**

Patent Assignee: UNIV RICE WILLIAM MARSH (UYRI-N)
Inventor: COLBERT D T; HAFNER J H; SMALLEY R E; SMITH K
Number of Countries: 088 Number of Patents: 004
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 200017102	A1	20000330	WO 99US21367	A	19990917	200025	B
AU 9961484	A	20000410	AU 9961484	A	19990917	200035	
EP 1115655	A1	20010718	EP 99948270	A	19990917	200142	
			WO 99US21367	A	19990917		
KR 2001079867	A	20010822	KR 2001703540	A	20010319	200213	

Priority Applications (No Type Date): US 98101093 P 19980918
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 200017102	A1	E	33	C01B-031/02	

Designated States (National): AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG US UZ VN YU ZA ZW
Designated States (Regional): AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SL SZ TZ UG ZW

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
AU 9961484	A			C01B-031/02	Based on patent WO 200017102
EP 1115655	A1	E		C01B-031/02	Based on patent WO 200017102

Designated States (Regional): AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
KR 2001079867	A			C01B-031/02	

Abstract (Basic): WO 200017102 A1
NOVELTY - Single-wall **carbon nanotubes** are produced by:
(a) providing an active nanoscale particulate transition metal catalyst supported on an inert surface in a reaction zone;
(b) supplying a gaseous **carbon** -containing compound to the reaction zone; and
(c) contacting the gaseous **carbon** -containing compound in the reaction zone with small diameter active supported catalyst particles.
DETAILED DESCRIPTION - Single-wall **carbon nanotubes** are produced by:
(a) providing an active nanoscale particulate transition metal catalyst supported on an inert surface in a reaction zone which is maintained at an elevated temperature;
(b) supplying a gaseous **carbon** -containing compound to the reaction zone; and
(c) contacting the gaseous **carbon** -containing compound in the reaction zone with small diameter active supported catalyst particles.
The compound is supplied in a way that the diameter of the inactive catalyst particles is large enough to catalyze the production of **multi - wall carbon nanotubes** . The small diameter active supported

catalyst catalyzes the production of single-wall **carbon nanotubes** .
USE - For producing single-wall **carbon nanotubes** .
ADVANTAGE - The invention demonstrate a means of nucleating and growing **nanotubes** only from the smallest of the supported catalyst particles while deactivating the larger particles so that no multi-walled **nanotubes** are produced. The formed single-wall **nanotubes** are observed to form into organized bundles or ropes as they grow from catalyst particles.
pp; 33 DwgNo 0/6
Title Terms: PRODUCE; SINGLE; WALL; **CARBON** ; METAL; CATALYST; SUPPORT; REACT; ZONE; SUPPLY; GAS; **CARBON** ; CONTAIN; COMPOUND; CONTACT; COMPOUND; CATALYST; PARTICLE
Derwent Class: E36; J04; L02
International Patent Class (Main): C01B-031/02
File Segment: CPI

17/5/13 (Item 13 from file: 350)
DIALOG(R)File 350:Derwent WPIX

012721223 **Image available**
WPI Acc No: 1999-527335/199944
XRAM Acc No: C99-154858
XRPX Acc No: N99-390626
Microfastening **system for e.g. the assembly of nano-robots**
Patent Assignee: UNIV MICHIGAN STATE (UNMS)
Inventor: ENBODY R; KWON Y; TOMANEK D
Number of Countries: 083 Number of Patents: 003
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 9940812	A1	19990819	WO 99US2897	A	19990211	199944	B
AU 9927626	A	19990830	AU 9927626	A	19990211	200003	
EP 1054607	A1	20001129	EP 99908118	A	19990211	200063	
			WO 99US2897	A	19990211		

Priority Applications (No Type Date): US 9874463 P 19980212
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 9940812	A1	E	16	A44B-018/00	

Designated States (National): AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GE GH GM HR HU ID IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG US UZ VN YU ZW
Designated States (Regional): AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SZ UG ZW

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
AU 9927626	A			A44B-018/00	Based on patent WO 9940812
EP 1054607	A1	E		A44B-018/00	Based on patent WO 9940812

Designated States (Regional): AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

Abstract (Basic): WO 9940812 A1
NOVELTY - A **microfastening** system comprises first and second **fastening** elements each having extending **nanotubes** .
DETAILED DESCRIPTION - The system comprises first and second elements each having **nanotubes** extending from a substrate. Preferred substrate materials are **metals** , **carbon** , **silicon** , **germanium** , **polymers** and composites. The **nanotubes** may be **multiwalled** and are preferably functionalized to a nonlinear shape, preferably a **hook** , **loop** or **spiral** . The **nanotubes** are preferably selectively **deformable** .
INDEPENDENT CLAIMS are included for the following: (a) the **microfastener** element; and (b) a method for forming the **microfastener**

in which the **nanotubes** are attached to the substrate, preferably in the presence of an electric field. The **nanotubes** may be functionalized before, during or after attachment.

USE - As a **reusable fastener** for the assembly of nano-robots useful in microsurgery, surface coatings and the attachment of metal contacts to integrated semiconductor devices.

ADVANTAGE - The bonds are highly stable, very high strength and can be reopened and re-closed.

DESCRIPTION OF DRAWING(S) - The drawing shows a **micro - fastening** system based on graphite **carbon nanotubes** functionalized to form a **mating hook** and **loop** .

pp; 16 DwgNo 3A/4

Title Terms: SYSTEM; ASSEMBLE; NANO; ROBOT
Derwent Class: A35; A85; L03; P23; U12
International Patent Class (Main): A44B-018/00
File Segment: CPI; EPI; EngPI

17/5/14 (Item 14 from file: 350)
DIALOG(R)File 350:Derwent WPIX

011214880 **Image available**
WPI Acc No: 1997-192805/199717
XRAM Acc No: C97-061632

Carbon @ **single wall** nanotube **manufacture giving higher conductivity than** multiwall **types - by forming mixture of** carbon @ **and group-VIII transition metal vapour with laser pulse, then condensing to give** nanotube **with live end**

Patent Assignee: UNIV RICE WILLIAM MARSH (UYRI-N)
Inventor: COLBERT D T; GUO T; NIKOLAEV P; RINZLER A G; SMALLEY R E; THESS A
Number of Countries: 074 Number of Patents: 006
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 9709272	A1	19970313	WO 96US14188	A	19960906	199717	B
AU 9670139	A	19970327	AU 9670139	A	19960906	199729	
EP 854839	A1	19980729	EP 96931464	A	19960906	199834	
			WO 96US14188	A	19960906		
US 6183714	B1	20010206	US 953449	P	19950908	200109	
			US 9616313	P	19960508		
			US 96687665	A	19960726		
JP 2001520615	W	20011030	WO 96US14188	A	19960906	200202	
			JP 97511359	A	19960906		
EP 854839	B1	20020424	EP 96931464	A	19960906	200228	
			WO 96US14188	A	19960906		
			EP 2001202903	A	19960906		

Priority Applications (No Type Date): US 96687665 A 19960726; US 953449 P 19950908; US 9616313 P 19960508
Cited Patents: 8.Jnl.Ref; US 5300203
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 9709272	A1	E	41	C01B-031/02	

Designated States (National): AL AM AT AU AZ BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GE HU IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK TJ TM TR TT UA UG UZ VN
Designated States (Regional): AT BE CH DE DK EA ES FI FR GB GR IE IT KE LS LU MC MW NL OA PT SD SE SZ UG

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
AU 9670139	A			C01B-031/02	Based on patent WO 9709272
EP 854839	A1	E		C01B-031/02	Based on patent WO 9709272

Designated States (Regional): AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 6183714	B1			D01F-009/12	Provisional application US 953449

			Provisional application US 9616313
JP 2001520615	W	44 C01B-031/02	Based on patent WO 9709272
EP 854839	B1 E	C01B-031/02	Related to application EP 2001202903
			Based on patent WO 9709272

Designated States (Regional): AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

Abstract (Basic): WO 9709272 A

Carbon vapour is formed using a laser pulse to ablate material from a **carbon** target, then before the ablated material has dissipated and focussed a second laser pulse is timed to arrive at the target and is absorbed by the ablated material to form a vapour which is condensed to form **carbon** **nanotubes** . Single wall **nanotubes** are formed by vaporising a mixt. of **carbon** and a Group VIII transition metal with a laser pulse, then condensing the vapour to obtain a single wall **carbon** **nanotube** with a live end, followed by supplying **carbon** vapour to the live end while maintaining the live end in an annealing zone.

Also claimed are: (a) a rope of single wall **carbon** **nanotubes** having 50-5000 **nanotubes** of which >10% are (10, 10) single wall type; and (b) felt ropes of single wall **carbon** **nanotubes** .

USE - **Nanotubes** are used in the manufacture of electrical connectors in micro devices such as integrated circuits, computer semiconductor microchips, as antenna at optical frequencies, probes in scanning tunnel or atomic force microscopes, or as strengthening agents in composites for tyres, airplane wings, golf clubs or fishing rods, or as catalyst supports or are used to reinforce **polymers** .

ADVANTAGE - **Nanotubes** are clean, defect free, stronger and more conductive than **multiwall** types.

Dwg.1/3

Title Terms: **CARBON** ; SINGLE; WALL; MANUFACTURE; HIGH; CONDUCTING; **MULTIWALL** ; TYPE; FORMING; MIXTURE; **CARBON** ; GROUP-VIII; TRANSITION; METAL; VAPOUR; LASER; PULSE; CONDENSATION; LIVE; END

Derwent Class: A60; E36; L03; Q68; U11

International Patent Class (Main): C01B-031/02; D01F-009/12

International Patent Class (Additional): B01J-023/89; B82B-003/00; D04H-001/42

21/5/1 (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX

014236645 **Image available**
WPI Acc No: 2002-057343/200208
XRAM Acc No: C02-016552

Production of article mold for rapid tooling, employs mold matrix material containing fibers of specific length and thickness

Patent Assignee: SWIFT TECHNOLOGIES LTD (SWIF-N)
Inventor: SHEPHEARD P; SHEPHEARD P A
Number of Countries: 096 Number of Patents: 004
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
GB 2360244	A	20010919	GB 200113055	A	20010530	200208	B
WO 200191984	A1	20011206	WO 2001GB2387	A	20010530	200208	
GB 2360244	B	20020220	GB 200113055	A	20010530	200214	
AU 200160462	A	20011211	AU 200160462	A	20010530	200225	

Priority Applications (No Type Date): GB 200013092 A 20000530
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
GB 2360244	A		53	B29C-045/26	
WO 200191984	A1	E		B29C-033/40	

Designated States (National): AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
Designated States (Regional): AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
GB 2360244	B			B29C-045/26	
AU 200160462	A			B29C-033/40	Based on patent WO 200191984

Abstract (Basic): GB 2360244 A

NOVELTY - Producing a mold comprises pressing a mold matrix material around an article pattern in a chamber bound by solid retainer; causing the mold matrix material to harden to produce a flexible mold; and removing the pattern to leave a mold conforming to the pattern. The mold matrix material contains 10-90% by volume fibers having a length of 10-100 mum and a thickness of 0.1-30 mum.

DETAILED DESCRIPTION - Producing a mold comprises pressing a mold matrix material around a pattern of an article to be produced in a chamber bound by solid retainer; causing the mold matrix material to harden to produce a flexible mold (5); and removing the pattern to leave a mold conforming to the pattern. The flexible mold has a flexural strength of 20-175 MPa, flexural modulus of 700-5,000 MPa, tensile strength of 10-120 MPa, tensile modulus of 850-4,000 MPa, compressive strength of 30-200 MPa, compressive modulus of 400-5,000 MPa, hardness of 5-20 Vickers, and relative density of 0.5-3.0 g/cm3. The mold matrix material contains 10-90% by volume fibers having a length of 10-100 mum and a thickness of 0.1-30 mum.

An INDEPENDENT CLAIM is also included for a method of flash-free molding an article by injecting material into the mold of the invention under predetermined conditions of temperature and increasing the injection pressure such that the increase in pressure is transmitted into the mold body to increase the **mating** forces experienced between the mold halves at the split lines (7); and removing the molded article from the mold.

USE - For producing a mold for an article for rapid tooling.

ADVANTAGE - The invention enables verification of component design to be carried out prior to commitment to high cost tooling upon finalization of a design. It allows design iteration to be carried out relatively easily and cheaply. If the flexible mold is distorted during

the molding process, it has the dynamic power to return to its original shape when the injection pressure is applied so that any initial distortion is counteracted. The mold can be changed to suit particular criteria and to match the molding requirements of a particular end product. The invention can also be regulated to give flash-free molding.

DESCRIPTION OF DRAWING(S) - The figure shows a cross-sectional view of an assembled mold with a cavity filled with molding material.

Flexible mold (5)

Split lines (7)

pp; 53 DwgNo 1/11

Title Terms: PRODUCE; ARTICLE; RAPID; TOOLING; EMPLOY; MATRIX; MATERIAL; CONTAIN; SPECIFIC; LENGTH; THICK

Derwent Class: A32; A88

International Patent Class (Main): B29C-033/40; B29C-045/26

International Patent Class (Additional): B29C-033/38; B29C-039/26; B29C-043/18; B29C-045/37

File Segment: CPI

28/5/1 (Item 1 from file: 347)
DIALOG(R)File 347:JAPIO

06851950 **Image available**
ROTOR FOR CENTRIFUGAL SEPARATOR

PUB. NO.: 2001-079451 [JP 2001079451 A]
PUBLISHED: March 27, 2001 (20010327)
INVENTOR(s): AIZAWA MASAHARU
APPLICANT(s): HITACHI KOKI CO LTD
APPL. NO.: 11-263347 [JP 99263347]
FILED: September 17, 1999 (19990917)
INTL CLASS: B04B-005/02

ABSTRACT

PROBLEM TO BE SOLVED: To use a microplate, or the like, under high centrifugal acceleration by forming a bucket fulcrum holding means to contact the bottom surface of a bucket and the inside surface of the cylindrical outer wall of a rotor body during the rotation of a rotor and rotating it integrally by the contact between the rotor body and the bucket during high rotation.

SOLUTION: A rotor body 1 has a driving shaft **fastening** part 4 in the central part, a cylindrical outer wall 3 extends from a bottom plate 2 upward. A pin 6 which has a bucket 5 fitted swingably to the inner surface part of a rotor and is formed in the bucket 5 is fitted rotatably to a support part formed in the rotor body 1. The bucket 5 has a seat surface 8 for holding a microplate 14, and a stopper is installed in the lowest part of the seat surface 8. The bottom surface part 10 of the bucket 5 is formed to contact the outer wall inside surface part 11 of the rotor body 1. In this way, the microplate 14 or a microplate-shaped **microtube** assembly can be rotated under high centrifugal acceleration.

28/5/2 (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX

014073290 **Image available**
WPI Acc No: 2001-557503/200162
XRAM Acc No: C01-165721
XRPX Acc No: N01-414333

Drug delivery graft for delivering agent into natural tissue conduit, e.g. blood vessel, includes hollow tubing with bore running along exterior surface of graft in fluid communication with porous wall

Patent Assignee: IMPRA INC (IMPR-N); IMPRA INC SUBSIDIARY BARD INC C R (BRDC)
Inventor: CALCOTE R W
Number of Countries: 030 Number of Patents: 003
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 200152914	A1	20010726	WO 2001US2061	A	20010118	200162	B
EP 1121945	A1	20010808	EP 2000127283	A	20001219	200162	
US 6355063	B1	20020312	US 2000488625	A	20000120	200221	

Priority Applications (No Type Date): US 2000488625 A 20000120
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 200152914	A1	E	25	A61L-027/16	

Designated States (National): CA JP MX

Designated States (Regional): AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR
EP 1121945 A1 E A61L-027/16
Designated States (Regional): AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI TR
US 6355063 B1 A61F-002/06

Abstract (Basic): WO 200152914 A1

NOVELTY - A drug delivery graft comprises a graft (2) with a lumen and a porous wall, and a hollow tubing (4) with a bore running along an exterior surface of the graft in fluid communication with the porous wall. A drug can be infused into the bore to penetrate into the lumen of the graft through the wall.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for a process of manufacturing a drug delivery system comprising contacting a small diameter hollow tubing with a porous graft, and connecting an end of the small diameter beading to a drug source so that a drug enters the tubing and passes through the porous areas into the graft.

USE - The graft is useful for delivering an agent into a natural tissue conduit, e.g. blood vessel.

ADVANTAGE - The invention allows bioactive agent or drug to be renewed or changed after implant to the graft. It can be implanted in the same fashion as regular vascular grafts. The hollow tubing behaves much like the existing low profile solid beading and has a small diameter and can be readily implanted into the body. It serves as both a **spiral** support and a drug conduit.

DESCRIPTION OF DRAWING(S) - The figure shows a side view of a drug delivery graft.

Graft (2)
Hollow tubing (4)
Drug source (6)
pp; 25 DwgNo 1/6

Title Terms: DRUG; DELIVER; GRAFT; DELIVER; AGENT; NATURAL; TISSUE; CONDUIT ; BLOOD; VESSEL; HOLLOW; TUBE; BORE; RUN; EXTERIOR; SURFACE; GRAFT; FLUID ; COMMUNICATE; POROUS; WALL
Derwent Class: A96; B07; D16; P32; P34
International Patent Class (Main): A61F-002/06; A61L-027/16
International Patent Class (Additional): A61L-027/54; A61L-031/04; A61L-031/16
File Segment: CPI; EngPI

28/5/3 (Item 2 from file: 350)
DIALOG(R)File 350:Derwent WPIX

013829370 **Image available**
WPI Acc No: 2001-313582/200133
XRPX Acc No: N01-225261

Rotor for centrifugal separator rotates rotor body at high speed while contacting with bucket which is made to swing by centrifugal force

Patent Assignee: HITACHI KOKI KK (HITO)
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
JP 2001079451	A	20010327	JP 99263347	A	19990917	200133	B

Priority Applications (No Type Date): JP 99263347 A 19990917
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
JP 2001079451	A		6	B04B-005/02	

Abstract (Basic): JP 2001079451 A

NOVELTY - A bucket fulcrum holder holds a supporting point that centers the swing of a bucket (5) for a rotor body (1). The bucket is made to swing by a centrifugal force when a rotor is rotated and contacted to the bottom of the bucket and to the inner surface of the cylindrical external wall of a rotor body. The rotor body is rotated at high speed while contacting with the bucket.

DETAILED DESCRIPTION - A **fastening** portion (4) with the drive shaft of a centrifugal separator in the center of a baseplate (2). An external wall (3) expands from the baseplate to a cylindrical shape towards the upper side. The bucket holds a box-shaped sample holder inside the rotor body.

USE - For centrifugal separator.

ADVANTAGE - Allows rotation of micro plate or micro plate shaped **microtube** set under a centrifugal high acceleration. Quickens centrifuge of liquid sample injected into micro plate. Reduces manufacturing cost of rotor.

DESCRIPTION OF DRAWING(S) - The figure shows the longitudinal cross-sectional view of the rotor.

Rotor body (1)
Baseplate (2)
External wall (3)
Fastening portion (4)
Bucket (5)
pp; 6 DwgNo 1/5

Title Terms: ROTOR; CENTRIFUGE; SEPARATE; ROTATING; ROTOR; BODY; HIGH; SPEED; CONTACT; BUCKET; MADE; SWING; CENTRIFUGE; FORCE
Derwent Class: P41
International Patent Class (Main): B04B-005/02
File Segment: EngPI

28/5/4 (Item 3 from file: 350)
DIALOG(R)File 350:Derwent WPIX

012682662 **Image available**
WPI Acc No: 1999-488769/199941
XRAM Acc No: C99-143415

Nitrogen monoxide generation inhibitors - useful for treating e.g. septicemia, endotoxin shock, heart failure, shock, hypotension, rheumatic inflammation and chronic articular rheumatism

Patent Assignee: ONO PHARM CO LTD (ONOY)
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
JP 11209287	A	19990803	JP 9810973	A	19980123	199941	B

Priority Applications (No Type Date): JP 9810973 A 19980123
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
JP 11209287	A		13	A61K-031/505	

Abstract (Basic): JP 11209287 A

Nitrogen monoxide generation inhibitor contains 4-aminoquinazoline derivatives of formula (I), their non-toxic salts, acid-addition salts or hydrates as an active ingredient. R1 = H or 1-4C alkyl; R2 = 1-6C alkyl, or 7-14C polycyclic aliphatic hydrocarbon ring optionally substituted by 1-4C alkyl, 1-4C alkoxyl, halogen or trifluoromethyl; Z = single bond, methylene, ethylene, vinylene or ethynylene; CyB = 4-7 membered monocyclic unsaturated or partially saturated heterocyclic group which contains 1-3 N, 1-2 O, 1-2 S, 1-2 N and 1-2 S, or 1-2 N and 1-2 O; R3 = H, 1-4C alkyl, 1-4C alkoxyl, halo, or trifluoromethyl; R4 = H, 1-4C alkyl, 1-4C alkoxyl, -COOR8, NR9R10; R10 = H or 1-4C alkyl,

-NHCOR11 -NHSO2R11, -SO2NR9R10, -OCOR11, halogen, trifluoromethyl, hydroxyl, nitro, cyano, -SO2N=CHNR12R13, or CONR14R15; R15 = 1-4C alkyl, 1-4C alkylthio, 1-4C alkylsulfinyl, 1-4C alkylsulfonyl, ethynyl, hydroxymethyl, tri(1-4C alkyl)silylethynyl, or acetyl; m, n = 1 or 2; when Z = vinylene or ethynylene, CyB is not mediated by N to Z; R8 = H or 1-4C alkyl; R12 = H or 1-4C alkyl; R13 = 1-4C alkyl; R9 = H, 1-4C alkyl or phenyl(1-4C alkyl; R11 = 1-4C alkyl); R14 = H, 1-4C alkyl or phenyl(1-4C alkyl).

USE - The inhibitor is useful for prevention and/or treatment of septicemia, endotoxin shock, heart failure, shock, hypotension, rheumatic inflammation, chronic articular rheumatism, arthrosis **deformans** , ulcerative colitis, stress gastric ulcer, Crohn's disease, autoimmune diseases, tuberculosis, tissue impairment after organ transplantation, rejection reaction, ischemic reflow disorder, acute coronary **microtubule** embolus, shock vascular embolus, ischemic cerephalopathy, arterial infarction, pernicious anemia, Fanconi's anemia, sickle cell anemia, pancreatitis, nephrotic syndrome, glomerulonephritis, insulin-dependent diabetes melitus, hepatic porphyria, alcohol poisoning, parkinsonism, leukemia, tumor, myeloma, anti-cancer drug adverse effects, respiratory needy syndrome, pulmonary emphysema, Alzheimer's disease, multiple sclerosis, vitamin E deficiency, senility, sunburn, myodystrophy, cataract, influenza inflammation, malaria, AIDS, radiation impairment, burn, efficient ectogenesis, etc. (claimed).

ADVANTAGE - The inhibitor inhibits generation of nitrogen monoxide but not nitrogen monoxide synthetase.

Dwg.0/0

Title Terms: NITROGEN; GENERATE; INHIBIT; USEFUL; TREAT; ENDOTOXIN; SHOCK; HEART; FAIL; SHOCK; HYPOTENSIVE; RHEUMATISM; INFLAMMATION; CHRONIC; ARTICULAR; RHEUMATISM

Derwent Class: B02

International Patent Class (Main): A61K-031/505

International Patent Class (Additional): C07D-239/94

File Segment: CPI

28/5/5 (Item 4 from file: 350)

DIALOG(R)File 350:Derwent WPIX

009549387 **Image available**

WPI Acc No: 1993-242937/199330

XRPX Acc No: N93-186916

Body-passage-dilating catheter with balloon - has inner and outer balloon walls forming annular chamber and inner wall support allowing body fluid circulation

Patent Assignee: LAB NYCOMED INGENOR SA (NYCO-N); LAB NYCOMED SA (NYCO-N); LAB NYCOMED INGENOP SA (NYCO-N)

Inventor: BOUSSIGNAC G; LABRUNE J

Number of Countries: 020 Number of Patents: 009

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 9313826	A1	19930722	WO 93FR36	A	19930114	199330	B
FR 2686256	A1	19930723	FR 92499	A	19920117	199342	
AU 9335024	A	19930803	AU 9335024	A	19930114	199348	
			WO 93FR36	A	19930114		
EP 621793	A1	19941102	EP 93904082	A	19930114	199442	
			WO 93FR36	A	19930114		
US 5378237	A	19950103	US 92842550	A	19920227	199507	
JP 7505066	W	19950608	JP 93512203	A	19930114	199531	
			WO 93FR36	A	19930114		
EP 621793	B1	19960828	EP 93904082	A	19930114	199639	
			WO 93FR36	A	19930114		

DE 69304306	E	19961002	DE 604306	A	19930114	199645
			EP 93904082	A	19930114	
			WO 93FR36	A	19930114	
ES 2093958	T3	19970101	EP 93904082	A	19930114	199708

Priority Applications (No Type Date): FR 92499 A 19920117
Cited Patents: EP 418147; US 4581017; US 4646742; US 4790315; US 4877031
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 9313826	A1	F	25	A61M-029/02	
AU 9335024	A			A61M-029/02	Based on patent WO 9313826
EP 621793	A1	F	25	A61M-029/02	Based on patent WO 9313826
US 5378237	A		13	A61M-029/00	
JP 7505066	W		8	A61M-029/02	Based on patent WO 9313826
EP 621793	B1	F	13	A61M-029/02	Based on patent WO 9313826
Designated States (Regional): AT BE CH DE DK ES FR GB GR IE IT LI LU MC NL PT SE					
DE 69304306	E			A61M-029/02	Based on patent EP 621793
					Based on patent WO 9313826
ES 2093958	T3			A61M-029/02	Based on patent EP 621793
FR 2686256	A1			A61M-025/10	

Abstract (Basic): WO 9313826 A

The outer catheter tube has a distal portion (6) distorting radially with balloon (2), either side of which are ports (3, 4) allowing the flow of fluid in the body passage inside the tube. An inner tube allows the passage of a guide, and a **micro - tube** (7) inside the outer one is connected between the balloon interior and a supply system for the inflating medium.

The balloon has an outer wall (8) bearing against the inside of the body passage and an inner one (9) sealed to the outer one so as to form an annular chamber (10) with it. A support keeps the inner wall in the working position, allowing body fluid to flow between it and the inner tube.

The outer tube can have a flexible portion, on the front of which a sheath is sealed, distorting radially and forming a body in the balloon.

ADVANTAGE - Easy to use, being particularly for the treatment of coronary arteries.

Dwg.3/10

Title Terms: BODY; PASSAGE; DILATED; CATHETER; BALLOON; INNER; OUTER; BALLOON; WALL; FORMING; ANNULAR; CHAMBER; INNER; WALL; SUPPORT; ALLOW; BODY; FLUID; CIRCULATE
Derwent Class: P34
International Patent Class (Main): A61M-025/10; A61M-029/00; A61M-029/02
File Segment: EngPI

28/5/6 (Item 5 from file: 350)
DIALOG(R)File 350:Derwent WPIX

009116240
WPI Acc No: 1992-243677/199230
XRAM Acc No: C92-109158

Combined thermo-bender and former for plastic - has two thermo-benders linearly heated by quartz IR micro tubes **at** bend **position and mounted face-to-face**

Patent Assignee: PREVOT G (PREV-I)
Inventor: PREVOT G
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week

FR 2669261	A1	19920522	FR 9014453	A	19901120	199230	B

Priority Applications (No Type Date): FR 9014453 A 19901120
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
FR 2669261	A1		8	B29C-053/06	

Abstract (Basic): FR 2669261 A

Device is claimed for rapidly, precisely and simultaneously making two bonds of same or different angles on two edges of a piece partic. made of plastic. Two thermo-bonders (A, B) placed face-to-face are connected by a mobile device (C) allowing variation of their distance, relative angles and plane inclination. The edge of the plastic to be formed is held in the thermo-bonder by a clamping bar (3) and the site of bonding linearily heated by a quartz infrared **microtube** (7).

The bonds are obtained simultaneously by rotating each thermo-bonder forming plate (8) by the desired angle in the sector (10) of a guide plate then immobilising in that position to act as a former during cooling.

USE/ADVANTAGE - Simultaneous prodn. of two edge bands partic. of plastic material to give formed parts, e.g., supports, boxes, plates, quickly and of high precision.

Dwg.0/3

Title Terms: COMBINATION; THERMO; **BEND** ; FORMER; PLASTIC; TWO; THERMO; **BEND** ; LINEAR; HEAT; QUARTZ; INFRARED; MICRO; TUBE; **BEND** ; POSITION; MOUNT; FACE-TO-FACE
Derwent Class: A32
International Patent Class (Main): B29C-053/06
File Segment: CPI

28/5/7 (Item 6 from file: 350)
DIALOG(R)File 350:Derwent WPIX

004640879
WPI Acc No: 1986-144222/198622
XRAM Acc No: C86-061782
XRPX Acc No: N86-106734

Portable blood typing in multiple test chambers - with deformable **walls to draw blood into chamber from** micro - tube

Patent Assignee: CEDARS SINAI MEDICAL CENTER (CEDA-N)
Inventor: GOLDFINGER D; HSI R C
Number of Countries: 010 Number of Patents: 008
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 8603008	A	19860522	WO 85US1590	A	19850822	198622	B
ZA 8506368	A	19860224	ZA 856368	A	19850822	198639	
EP 203930	A	19861210	EP 85904353	A	19850822	198650	
US 4650662	A	19870317	US 84670882	A	19841113	198713	
JP 62500954	W	19870416	JP 85503767	A	19850822	198721	
CA 1260386	A	19890926				198944	
EP 203930	B	19900711				199028	
JP 92071467	B	19921113	JP 85503767	A	19850822	199250	
			WO 85US1590	A	19850822		

Priority Applications (No Type Date): US 84670882 A 19841113
Cited Patents: SSR870513; US 2595493; US 29725; US 3175558; US 3433712; US 3572552; US 3605829; US 3620676; US 3707354; US 3713775; US 3811326; US 3905772; US 4079393; US 4104031; US 4167955; US 4178345; US 4472357; WO 7901131
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 8603008	A	E	28		

Designated States (National): JP
Designated States (Regional): BE DE FR GB IT NL
EP 203930 A E
Designated States (Regional): BE FR GB IT NL
EP 203930 B
Designated States (Regional): DE FR GB IT NL
JP 92071467 B 9 G01N-033/80 Based on patent JP 62500954
Based on patent WO 8603008

Abstract (Basic): WO 8603008 A

Blood is collected in multiple **microtubes** pref. arranged as a rigid array. The tubes are inserted into corresponding chambers of a portable testing appts. The chambers are arranged as a complementary array and each contains an appropriate reagent.

Each chamber has a resilient section which is initially pressed inwards when the **microtube** is inserted into the chamber. Once inserted, a seal is formed between the **microtube** and chamber and the resilient section of the chamber is then moved outwards to reduce the pressure within the chamber to draw blood into the chamber from the **microtube** .

USE/ADVANTAGE - The appts. is portable and used to check the blood type of a patient prior to infusion. Blood typing can be undertaken reliably away from a laboratory. (28pp Dwg.No.7/8

Title Terms: PORTABLE; BLOOD; TYPING; MULTIPLE; TEST; CHAMBER; **DEFORM** ; WALL; DRAW; BLOOD; CHAMBER; MICRO; TUBE
Derwent Class: J04; Q31; S03
International Patent Class (Main): G01N-033/80
International Patent Class (Additional): B01L-003/00; B65B-003/04; B65B-031/00; C12M-001/00; C12Q-001/24; G01N-001/00; G01N-033/48; G01N-035/06
File Segment: CPI; EPI; EngPI

28/5/8 (Item 7 from file: 350)
DIALOG(R)File 350:Derwent WPIX

002565892
WPI Acc No: 1980-83916C/198047
Rolling of internally threaded thin wall precision metal tubes - using reduced deformation **forces based on preliminary threading for insertion of threaded mandrel**
Patent Assignee: CHELYABINSK POLY (CHLP)
Inventor: BLYUMENKRA D L; MATVEEV V V; ZAIONCHIK L I
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
SU 727293	A	19800415				198047	B

Priority Applications (No Type Date): SU 2651161 A 19780731

Abstract (Basic): SU 727293 A

The process comprises external diameter reduction on a threaded mandrel.

To increase performance, the sleeve is first threaded to a mean diameter equal to the nominal thread diameter with 0-0.07mm deviations, for insertion of the mandrel.

Micro - tubes of an internal micrometer are rolled in the unhardened state on a hardened state on a hardened precision mandrel, the step error not exceeding plus-minus 2 mu, and the surface layer undergoing consolidation with rolling of the tube over its entire length. This system makes the internal surface of the tube conform to the shape and dimensions of the mandrel.

Title Terms: ROLL; INTERNAL; THREAD; THIN; WALL; PRECISION; METAL; TUBE; REDUCE; **DEFORM** ; FORCE; BASED; PRELIMINARY; THREAD; INSERT; THREAD; MANDREL
Derwent Class: M21; P52
International Patent Class (Additional): B21H-003/08
File Segment: CPI; EngPI

28/5/9 (Item 8 from file: 350)
DIALOG(R)File 350:Derwent WPIX

002076361
WPI Acc No: 1978-89437A/197849
Multichannel tubular device mfr. - by producing fused honeycomb array of sealed tubes
Patent Assignee: NI-TEC INC (NITE-N)
Inventor: SINGER J
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 4127398	A	19781128				197849	B

Priority Applications (No Type Date): US 65482327 A 19650820; US 63310971 A 19630918

Abstract (Basic): US 4127398 A
Multiple-channel **micro - tubular** device is formed by applying heat to a closely packed array of tubes of heat **deformable** material to fuse the tubes into a unitary honeycomb structure. The heated structure is drawn to reduce its cross-section and cut into segments which are sealed at their ends to entrap gas in each tube at a preselected temp below the fusion temp. of the material. The segments are packed together to form a cluster which is heated above the preselected temp. to fuse the segments into a unitary structure without collapsing the tubes.

Used in mfr. of channel electron multipliers, collimators in nuclear medicine and spray nozzles, filters and thermal diffusion fractionators employing a cluster of microscopic size tubes. The device formed has no pockets between the tubes. Process imposes no limitation on the length or overall configuration of the device as is the case in processes employing selective acid etching techniques
Title Terms: MULTICHANNEL; TUBE; DEVICE; MANUFACTURE; PRODUCE; FUSE; HONEYCOMB; ARRAY; SEAL; TUBE
Derwent Class: J01; L01; L03; Q62
International Patent Class (Additional): F16C-001/06
File Segment: CPI; EngPI

28/5/10 (Item 1 from file: 371)
000876248 **Image present**
Titre: Catheter de dilatation.
Deposant: NYCOMED INGENOR SA LABORATOIRE
Nom et Adresse du Deposant: LABORATOIRE NYCOMED INGENOR (SA) SOCIETE ANONYME- Deposant - 25, QUAI DE LA GARE - CE N 19 75644 PARIS CEDEX 13 FRANCE (FR-75644)
Nom Inventeurs: BOUSSIGNAC GEORGES - 1, AVENUE DE PROVENCE 92160 ANTONY FRANCE (FR-92160); LABRUNE JEAN-CLAUDE - 116, RUE D'AGUESSEAU 92100 BOULOGNE FRANCE
Nom Mandataire: BEAU DE LOMENIE
Nature de Publication: Brevet
Information de Brevet et Priorites (Pays, Numero, Date):
Numero Publication: FR 2686256 - 19930723

Numero Depot: FR 92499 - 19920117
Priorites: FR 92499 - 19920117
Rapport de Recherche Preliminaire (Brevet/Reference, Code de Pertinence):
Rapport de Recherche
EP 418147 A (Cat. A)
US 4790315 A (Cat. D,A)
US 4877031 A (Cat. A)
US 4646742 A (Cat. A)
US 4581017 A (Cat. A)

Resume:
La presente invention concerne un catheter de dilatation, comprenant: - un element tubulaire externe comportant une portion **deformable** radialement comportant un ballon; - un element tubulaire interne (1); - un **micro** - **tube** (7), pour permettre le gonflage et le degonflage dudit ballon. Selon l'invention, le ballon (2) comprend une paroi externe destinee a venir en contact avec la paroi interne dudit canal corporel, en position d'utilisation; et une paroi interne fixee de maniere etanche a ladite paroi externe et susceptible de delimiter avec celle-ci, en position d'utilisation, une cavite interne annulaire; et ce catheter comprend en outre un element de support conforme pour maintenir en position d'utilisation ladite paroi interne du ballon, tout en permettant la circulation du fluide corporel dans l'espace compris entre ledit element interne et la paroi interne (9) du ballon. L'invention trouve notamment application dans le traitement des affections des arteres coronaires.

Classification Internationale (Principale): A61M-025/10

Descripteurs Francais: CATHETER; DILATATION; BALLONNET GONFLABLE; CONDUIT CORPOREL; VAISSEAU SANGUIN
Descripteurs Anglais: CATHETER; DILATATION; INFLATABLE BALLOON; CORPOREAL CHANNEL; BLOOD VESSEL

32/5/1 (Item 1 from file: 347)
DIALOG(R)File 347:JAPIO

06680358 **Image available**
COVER GASKET

PUB. NO.: 2000-266187 [JP 2000266187 A]
PUBLISHED: September 26, 2000 (20000926)
INVENTOR(s): MATSUMOTO KENJI
APPLICANT(s): UCHIYAMA MFG CORP
APPL. NO.: 11-069369 [JP 9969369]
FILED: March 16, 1999 (19990316)
INTL CLASS: F16J-015/12; F01M-011/00; F02F-011/00

ABSTRACT

PROBLEM TO BE SOLVED: To prevent **deformation** , and to enhance seal performance by extending an inner peripheral part and an outer peripheral part of an insert material for arranging gaskets on upper/lower both surfaces, and respectively hookingly **fastening** /installing hooking parts having the tip parts mutually **bent** in the inverse direction to/on a side surface of a cover member and a side surface of a block member.

SOLUTION: End parts of an insert material 3b being a reinforcing material are extended in the peripheral direction, hooking parts 3c are formed by **bending** these, a side surface of a cover member 1 and a side surface of a block member 2 are constricted by these hooking parts 3c at assembling installing time, a shape of the cover member 1 trying to be swollen and **deformed** is maintained by **fastening** pressure, and the hooking parts 3c of the insert material 3b formed by being mutually **bent** in the inverse direction operate to mutually pull mutual members 1, 2, particularly, the **mating** face part in the **hook** shape. When forming the insert material 3b in a closed **loop** shape along a **mating** face, since the closed **loop** shape itself becomes a strong structure, the hooking parts 3c can be arranged only on one side.

32/5/2 (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX

013270337 **Image available**
WPI Acc No: 2000-442243/200038
XRAM Acc No: C00-134411
XRPX Acc No: N00-330041
Disposable absorbent article for outgrown children going through potty training stage has fastening **system with two** fastening **components disposed on elastomeric side panels of waist regions**
Patent Assignee: KIMBERLY-CLARK WORLDWIDE INC (KIMB)
Inventor: OLSON C P
Number of Countries: 089 Number of Patents: 002
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 200035397	A1	20000622	WO 99US30329	A	19991217	200038	B
AU 200020571	A	20000703	AU 200020571	A	19991217	200046	

Priority Applications (No Type Date): US 99444635 A 19991122; US 98112775 P 19981218
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 200035397	A1	E	34	A61F-013/15	

Designated States (National): AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CU CZ DE DK DM EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG UZ VN YU ZA ZW
Designated States (Regional): AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SL SZ TZ UG ZW

AU 200020571 A A61F-013/15 Based on patent WO 200035397

Abstract (Basic): WO 200035397 A1

NOVELTY - A disposable absorbent article comprises a **fastening** system (80) with two **fastening** components (82, 83) disposed on the elastomeric side panels (34) in the back and front waist regions (22, 24), respectively.

DETAILED DESCRIPTION - A disposable absorbent pant defining a longitudinal axis, front and back longitudinally spaced waist regions, and a crotch region (26) which extends between and interconnects the front and back waist regions, comprises (i) a liquid permeable bodyside liner (42); (ii) a liquid impermeable outer cover bonded to the bodyside liner; (iii) an absorbent assembly (44) disposed between the bodyside liner and the outer cover (40); (iv) elastomeric side panels bonded to the outer cover in at least the back waist region; (v) a pair of first **fastening** components disposed on the elastomeric side panels in the back waist region; and (vi) a pair of second **fastening** components disposed in the front waist region. The two **fastening** components comprise mechanical **fastening** elements that are adapted to releasably engage one another to define **mating** pairs of **fasteners** and form a waist opening and a pair of leg openings. Each of the two components has an inner edge disposed toward one of the leg openings, an opposite outer edge disposed toward the waist opening, a length dimension that is parallel to the longitudinal axis (48), a width dimension, a length-to-width ratio of at least 5. The component(s) of each **mating** pair of **fasteners** has hinge area (s) that transversely bisects the component(s). The hinge area is offset along the length dimension closer to the inner end edge that the outer end edge (70, 72). An INDEPENDENT CLAIM is also included for a method of making an absorbent article defining a longitudinal axis, a transverse axis (49), first waist region, an opposite second waist region, and a crotch region which extends between and interconnects the two waist regions comprising the above invention.

USE - For outgrown children going through potty training stage.

ADVANTAGE - The invention provides level of fit and comfort in use that has come to be associated with the current training pants (20), and affords easier access to the interior of the pant for inspection purposes. The **fasteners** article having hinge areas cause the **fasteners** to **bend** in conformity with the movements of the wearer's body. The hinge areas prevent localized build up of stresses that would predispose the **fastener** to disengage unexpectedly.

DESCRIPTION OF DRAWING(S) - The figure illustrates a plan view of disposable absorbent article.

Training pants (20)
Front and back waist regions (22, 24)
Crotch region (26)
Side panels (34)
Outer cover (40)
Bodyside liner (42)
Absorbent assembly (44)
Longitudinal axis (48)
Transverse axis (49)
Inner and outer end edges (70, 72)
Fastening system (80)
Fastening components (82, 83)
pp; 34 DwgNo 3/7

Title Terms: DISPOSABLE; ABSORB; ARTICLE; CHILD; THROUGH; POTTY; TRAINING;

STAGE; **FASTEN** ; SYSTEM; TWO; **FASTEN** ; COMPONENT; DISPOSABLE; ELASTOMER; SIDE; PANEL; WAIST; REGION
Derwent Class: D22; F07; P32
International Patent Class (Main): A61F-013/15
File Segment: CPI; EngPI

32/5/3 (Item 2 from file: 350)
DIALOG(R)File 350:Derwent WPIX

013033576 **Image available**
WPI Acc No: 2000-205427/200018
XRAM Acc No: C00-063269
XRPX Acc No: N00-152890
Nonwoven web useful in e.g., mechanical fastening **, has arched filaments aligned within a specified minimum tensile modulus direction axis**
Patent Assignee: UNIV TENNESSEE RES CORP (UYTE-N)
Inventor: HASSENBOEHLER C B
Number of Countries: 023 Number of Patents: 002
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 200006373	A1	20000210	WO 99US15422	A	19990709	200018	B
TW 434341	A	20010516	TW 99111750	A	19990712	200170	

Priority Applications (No Type Date): US 98124716 A 19980730
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 200006373	A1	E	22	B32B-003/02	

Designated States (National): BR CA CZ MX
Designated States (Regional): AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE

TW 434341	A			D04H-001/56	

Abstract (Basic): WO 200006373 A1

NOVELTY - Nonwoven web comprises a nonwoven web plane (10) having machine (11) and cross (13) direction axes, and a minimum tensile modulus axis; and arched filament(s) (12), each with two base regions (14) attached to the web plane and defining an axis within 45degrees of a minimum tensile modulus axis. The filaments have a leg region (16) attached to the base regions and projecting out of the web plane.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for a method for producing arched filaments in a woven web having machine direction edges, which comprises heating a nonwoven web to permit plastic **deformation** of the filaments in response to an applied tensile stress, gripping a nonwoven web plane having machine and cross direction axes, and applying a tensile force to a nonwoven web plane in the direction of a machine or a cross direction axis of sufficient magnitude to cause an arching of filament(s) out of the plane.

USE - The nonwoven web is used in mechanical **fastening** , filtering applications, and for nonwovens utilizing bias stretch.

ADVANTAGE - The invented nonwoven web provides arches having a greater surface area than conventional **loop** **fasteners** , which increases the probability that a **hook** from a **mating** strip of **fastener** material will engage each **loop** , and thus producing a mechanical **fastener** having superior peel strength.

DESCRIPTION OF DRAWING(S) - A figure shows an isometric view of the web plane.

Nonwoven web plane (10)
Machine direction axis (11)
Arched filament (12)
Base region (14)
Substrate (15)

Leg region (16)
pp; 22 DwgNo 1/5
Title Terms: NONWOVEN; WEB; USEFUL; MECHANICAL; **FASTEN** ; ARCH; FILAMENT; ALIGN; SPECIFIED; MINIMUM; TENSILE; MODULUS; DIRECTION; AXIS
Derwent Class: A88; F04; J01; P64; P73
International Patent Class (Main): B32B-003/02; D04H-001/56
International Patent Class (Additional): B28B-011/08; B32B-005/26; B32B-027/14
File Segment: CPI; EngPI

32/5/4 (Item 3 from file: 350)
DIALOG(R)File 350:Derwent WPIX

012328323 **Image available**
WPI Acc No: 1999-134430/199912
XRAM Acc No: C99-039524
XRPX Acc No: N99-098080
Integrally moulded hook **for** loop **and** hook fastener **system - has flat substrate carrying rows of engaging elements having stems topped by radially extending engagement elements with cut-outs at remote end**
Patent Assignee: YKK CORP (YOSI); YOSHIDA KOGYO KK (YOSI)
Inventor: AKENO M
Number of Countries: 030 Number of Patents: 007
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
EP 897677	A2	19990224	EP 98115727	A	19980820	199912	B
JP 11056413	A	19990302	JP 97223909	A	19970820	199919	
US 5913482	A	19990622	US 98136017	A	19980819	199931	
CN 1213609	A	19990414	CN 98118615	A	19980819	199933	
BR 9804621	A	19991116	BR 984621	A	19980820	200012	
KR 99023731	A	19990325	KR 9833733	A	19980820	200024	
KR 278084	B	20010201	KR 9833733	A	19980820	200210	

Priority Applications (No Type Date): JP 97223909 A 19970820
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
EP 897677	A2	E	22	A44B-018/00	
Designated States (Regional): AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI					
JP 11056413	A		14	A44B-018/00	
CN 1213609	A			B29D-005/08	
KR 99023731	A			A44B-018/00	
KR 278084	B			A44B-018/00	Previous Publ. patent KR 99023731

Abstract (Basic): EP 897677 A

A integrally moulded surface **fastener** comprises a large number of engaging elements (2) standing from the surface of a substrate (1), each adapted to releasably engage **mating** **loops** of a matching **loop** **fastener** . Each element has at least two necks (22) extending in different directions radially from the stem (21) each having at its top end engaging heads (23) with a cut-out (23b) at an outboard end.

USE - The **hook** element is for a **hook** and **loop** type **fastener** system which can be produced in various sizes to suit particular application which include heavy duty industrial applications, workers clothing, paper nappies (diapers), etc..

ADVANTAGE - The durable, flexible **fastener** element has high anti tear, engaging, shear and peeling strengths of a desired level and will reliably engage fine and dense fibrous **loops** of the matching non-woven surface **fastener** overcoming problems experienced in prior art moulded systems of **bending** , breaking, high wear and low engagement with **mating** **loops** especially associated with smaller

sized elements.
Dwg.3/13

Title Terms: INTEGRAL; MOULD; **HOOK** ; **LOOP** ; **HOOK** ; **FASTEN** ; SYSTEM; FLAT; SUBSTRATE; CARRY; ROW; ENGAGE; ELEMENT; STEM; TOP; RADIAL; EXTEND; ENGAGE; ELEMENT; CUT-OUT; REMOTE; END

Derwent Class: A83; D22; F07; P23

International Patent Class (Main): A44B-018/00; B29D-005/08

International Patent Class (Additional): A61F-013/56; B29C-041/26; B29C-041/40

File Segment: CPI; EngPI

32/5/5 (Item 4 from file: 350)

DIALOG(R)File 350:Derwent WPIX

012089601 **Image available**

WPI Acc No: 1998-506512/199843

XRPX Acc No: N98-394837

Method of constructing self-supporting toy structure - using constructing piece of material having faces covered with hook -and- loop fastened **formations,** bending **construction piece, and holding in curved configuration by attachment of additional construction pieces**

Patent Assignee: KROECHER DESIGNS INC (KROE-N)

Inventor: KROECHER A

Number of Countries: 021 Number of Patents: 002

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 9840143	A1	19980917	WO 98CA206	A	19980309	199843	B
AU 9866059	A	19980929	AU 9866059	A	19980309	199906	

Priority Applications (No Type Date): US 97814638 A 19970310

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 9840143	A1	E	29	A63H-033/04	

Designated States (National): AU CA JP US

Designated States (Regional): AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL PT SE

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
AU 9866059	A			A63H-033/04	Based on patent WO 9840143

Abstract (Basic): WO 9840143 A

The method for making a self supporting toy structure, comprises the employment of a flexible construction piece comprising a flexible sheet of material having first and second major faces, the sheet having a shape defined by peripheral edges, the faces each entirely covered with **hook** -and- **loop** **fastener** formations.

The construction piece is **bent** about a **bend** axis into a curved configuration where the first and second faces are curved and the construction piece resists **bending** about axes perpendicular to the **bend** axis. The construction piece is held in the curved configuration by attaching the construction piece to one or more additional construction pieces by **hook** -and- **loop** inter-engagement between the **fastener** formation on one or both faces of the construction piece and **mating** **fastener** formations on the second construction pieces.

ADVANTAGE - Is safe to use by small children, and permits construction of a wide variety of three-dimensional structures which appeal to children of either sex.

Dwg.4/11

Title Terms: METHOD; CONSTRUCTION; SELF; SUPPORT; TOY; STRUCTURE; CONSTRUCTION; PIECE; MATERIAL; FACE; COVER; **HOOK** ; **LOOP** ; **FASTEN** ; FORMATION; **BEND** ; CONSTRUCTION; PIECE; HOLD; CURVE; CONFIGURATION; ATTACH; ADD; CONSTRUCTION; PIECE

Derwent Class: P36

International Patent Class (Main): A63H-033/04
File Segment: EngPI

32/5/6 (Item 5 from file: 350)
DIALOG(R)File 350:Derwent WPIX

011905485 **Image available**
WPI Acc No: 1998-322395/199828
XRPX Acc No: N98-252105

Sheet product e.g. Velcro **(RTM) - has yarn forming loops, with yarn positioned between pair of projections which are heat bonded**

Patent Assignee: PARELLADA L (PARE-I); VELCRO IND BV (VELC)
Inventor: PARELLADA L
Number of Countries: 019 Number of Patents: 003
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 9823181	A1	19980604	WO 97EP6667	A	19971119	199828	B
EP 942667	A1	19990922	EP 97951268	A	19971119	199943	
			WO 97EP6667	A	19971119		
US 5981027	A	19991109	US 96756236	A	19961126	199954	

Priority Applications (No Type Date): US 96756236 A 19961126
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 9823181	A1	E	23	A44B-018/00	

Designated States (National): JP
Designated States (Regional): AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL PT SE

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
EP 942667	A1	E		A44B-018/00	Based on patent WO 9823181

Designated States (Regional): DE ES

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 5981027	A			A44B-018/00	

Abstract (Basic): WO 9823181 A

The sheet product includes a moulded base part and an array of moulded projections (8) integral with the base part and extending at spaced intervals from one surface of the base part. One length of yarn extends past several of the projections and are secured to the base part by the projections in a **deformed** state.

Several rows of the projections and yarns forming loops co-operate and **fasten** with a **mating fastening** . The moulded projections are arranged in localised pairs. The yarn is positioned between the projections of pairs of the projections. The outer ends of the projections are heat bonded to the base and to the yarns.

ADVANTAGE - Reduces cost and complexity and increases performance.

Dwg.8/16

Title Terms: SHEET; PRODUCT; RTM; YARN; FORMING; LOOP; YARN; POSITION; PAIR ; PROJECT; HEAT; BOND
Derwent Class: P23
International Patent Class (Main): A44B-018/00
File Segment: EngPI

32/5/7 (Item 6 from file: 350)
DIALOG(R)File 350:Derwent WPIX

011266338 **Image available**
WPI Acc No: 1997-244241/199722
XRPX Acc No: N97-201496

Bumper device for use in adhering bumper sticker to automobile or other essentially flat surface - has clear, trimmable mounting sheet which can

receive bumper sticker and then be attached to bumper of automobile using hook and loop fastener strips
Patent Assignee: COURTNEY J L (COUR-I)
Inventor: COURTNEY J L
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 5622389	A	19970422	US 96599164	A	19960209	199722	B

Priority Applications (No Type Date): US 96599164 A 19960209
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 5622389	A		4	B42D-015/00	

Abstract (Basic): US 5622389 A

The bumper device comprises a **deformable** mounting sheet capable of being shaped to match the shape of the bumper sticker. The sheet has a rear face. A securing member secures the mounting sheet to the bumper.

The securing member includes at least one pair of **mating hook** and **loop fastener** strips. One **fastener** strip is attached to the rear face of the mounting sheet and the other **fastener** strip is attached to the bumper. The mounting sheet is clear in colour and is made of plastics.

USE/ADVANTAGE - For use in adhering a bumper sticker to the bumper of an automobile or other essentially flat surface. Allows a bumper sticker to be easily installed and removed. Is not visible upon application and thereby gives the appearance that the sticker is placed directly on the automobile bumper.

Dwg.2/2
Title Terms: BUMPER; DEVICE; ADHERE; BUMPER; STICKER; AUTOMOBILE; ESSENTIAL ; FLAT; SURFACE; CLEAR; TRIM; MOUNT; SHEET; CAN; RECEIVE; BUMPER; STICKER ; ATTACH; BUMPER; AUTOMOBILE; **HOOK** ; **LOOP** ; **FASTEN** ; STRIP
Derwent Class: P76
International Patent Class (Main): B42D-015/00
File Segment: EngPI

32/5/8 (Item 7 from file: 350)
DIALOG(R)File 350:Derwent WPIX

010780941 **Image available**
WPI Acc No: 1996-277894/199628
XRAM Acc No: C96-088285
XRPX Acc No: N96-233644
Flexible cable retainer is web with mating fastener **pairs along sides and ends -** fasteners **are pref.** hook **and** loop **type and wrapped cable can readily be** bent **around corners.**
Patent Assignee: HOWELL K L (HOWE-I)
Inventor: HOWELL K L
Number of Countries: 020 Number of Patents: 002
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 9617197	A1	19960606	WO 95US15405	A	19951128	199628	B
US 5535787	A	19960716	US 94349666	A	19941202	199634	

Priority Applications (No Type Date): US 94349666 A 19941202
Cited Patents: US 3941159; US 4640032; US 4640039; US 4759963; US 4762750; US 4893381; US 4920235; US 5104076
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 9617197	A1	E	16	F16L-009/00	

Designated States (National): AU CA JP
Designated States (Regional): AT BE CH DE DK ES FR GB GR IE IT LU MC NL PT SE

US 5535787 A 8 F16L-009/00

Abstract (Basic): WO 9617197 A

A flexible cable retainer comprises a web (11) with **mating fastener** pairs along the sides (16, 17) and at the ends (18, 19), one of each pair on the inside and one on the outside surface. Web flexibility is such that it can be **bent** around a corner when wrapped and secured round a cable.

All **fasteners** are pref. of **hook** and **loop** type and the web is of polyurethane-impregnated woven nylon fabric, impregnated with a fire retardant and opt. having transverse reinforcing ribs, which may be e.g. of rubber or plastics and be bonded, sewn or moulded to the web.

USE - Used partic. for office or domestic data processing and communications equipment cables passing along floor, walls or furniture.

ADVANTAGE - The cable retainer is easy to use, can be re-used repeatedly, can be made to match floor and wall coverings, can form branches by joining edge and end **fasteners** , and is inexpensive.

Dwg.1/9

Title Terms: FLEXIBLE; CABLE; RETAIN; WEB; MATE; **FASTEN** ; PAIR; SIDE; END; **FASTEN** ; PREFER; **HOOK** ; **LOOP** ; TYPE; WRAP; CABLE; CAN; READY; **BEND** ; CORNER

Derwent Class: A88; Q67

International Patent Class (Main): F16L-009/00

File Segment: CPI; EngPI

32/5/9 (Item 8 from file: 350)

DIALOG(R)File 350:Derwent WPIX

010642060 **Image available**

WPI Acc No: 1996-139014/199614

XRAM Acc No: C96-043630

XRPX Acc No: N96-116500

Sealing tape for spacecraft RF shielding thermal blankets - is electrically non-conductive and prevents the generation of undesirable passive intermodulation products

Patent Assignee: LOCKHEED MISSILES & SPACE CO INC (LOCK)

Inventor: MCCLOSKEY T E

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 5494755	A	19960227	US 94257108	A	19940608	199614	B

Priority Applications (No Type Date): US 94257108 A 19940608

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 5494755	A		8	C09J-007/02	

Abstract (Basic): US 5494755 A

The electrically non-conductive and RF shielding tape is used for seaming together and for repairing holes or damaged parts of RF shielding thermal blankets of the kind used for covering metal components of communication spacecraft. The tape is constructed to prevent RF energy from penetrating the seams, holes or damages areas of the thermal blankets which, in the presence of certain metal-to-metal junctions or shapes, can produce undesirable passive intermodulation prods. (PIM).

The tape comprises: (a) a metallic barrier strip, which provided a

barrier to RF energy, comprising a strip of metal foil defined by an outboard surface, an inboard surface and opposed edge sides spaced at a distance that defines the strip width; and (b) a PIM shielding structure, which encapsulates the outboard and inboard surfaces and the side edges of the strip for electrically isolating and insulating the metal surfaces of the strip to prevent the formation of PIM-producing metal-to-metal junctions as the tape structure is applied to metal bodies or wound onto itself.

The PIM shielding structure comprises: (i) a strip of plastic material forming an outer layer of the tape and having a width greater than that of the metal foil strip, which provides side margins extending outward beyond the side edges of the metallic barrier strip; (ii) an adhesive adhering the outboard surface of the metal foil strip to the inboard surface of the plastic strip such that the side edges of the metal foil strip are within the side edges of the plastic strip and a pair of exposed side margins are left along the inboard surface of the plastic material; and (iii) a layer of adhesive gum material forming a bottom layer of the tape and disposed to cover and adhere to both the inboard surface of the metal foil strip and the exposed side margins of the inboard surface of the plastic material.

USE - The tape is used to seam/repair RF shielding thermal blankets such as those on transmit antenna boom assemblies of communications spacecraft.

ADVANTAGE - The adhesive acts as a means of attaching the tape to a substrate and also as an electrical insulator for the metal foil component of the tape. The tape is made up of readily available materials, its mfr. is simple and low cost and it is easier to apply and seal, esp. at **bends** , than prior art **mating** **hook** and **loop** **fasteners** . It may be used as an additional sealing means at the outer edge of a prior art seal that comprises a **Velcro** (RTM) **fastener** . As well as sealing seams, the tape may be used to patch damaged blankets or even applied directly as an RF surface shield, either by layering the tape in an overlapping pattern or by forming it into a large patch to cover a profile or other large area.

Dwg.2/8

Title Terms: SEAL; TAPE; SPACECRAFT; RF; SHIELD; THERMAL; BLANKET; ELECTRIC ; NON; CONDUCTING; PREVENT; GENERATE; UNDESIRABLE; PASSIVE; INTERMODULATION; PRODUCT
Derwent Class: A95; L03; V04
International Patent Class (Main): C09J-007/02
File Segment: CPI; EPI

32/5/10 (Item 9 from file: 350)
DIALOG(R)File 350:Derwent WPIX

009981941 **Image available**
WPI Acc No: 1994-249652/199431
XRPX Acc No: N94-197269

Eaves trough down spout connection method - involves installing hooked pile fasteners **on drainage extension outer end and on down spout, before raising extension**

Patent Assignee: METRO EAVESTROUGHING LTD (METR-N)
Inventor: SICOTTE D; SICOTTE J
Number of Countries: 002 Number of Patents: 003
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
CA 2083920	A	19940527	CA 2083920	A	19921126	199431	B
US 5375891	A	19941227	US 92990046	A	19921214	199506	N
CA 2083920	C	19990525	CA 2083920	A	19921126	199939	

Priority Applications (No Type Date): CA 2083920 A 19921126; US 92990046 A

19921214
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
CA 2083920	A		20	E04D-013/06	
US 5375891	A		9	F16L-027/00	
CA 2083920	C	E		E04D-013/08	

Abstract (Basic): CA 2083920 A

The method involves providing a universal connector with portions having two different cross sections, one capable of fitting outside several industry standard cross-sectioned downspouts. The other is capable of fitting inside several industry standard drainage extensions. It has a hinge between the two portions. A **mating** **loop** -and- **hook** pair is installed on the drainage extension's outer end and at an appropriate place up the downspout.

Thus, a downspout with a rounded, or squared, or rectangular, cross section can be connected to an extension, with any of these cross sections, making a total of nine permutations, and more if minor **bending** or fitting of further sizes and shapes of downspouts or extensions is undertaken. Then the extension can be raised to a vertical position and reversibly **fastened** there.

USE - A method for connecting industry standard eaves trough downspouts to drainage extensions of a similar or dissimilar cross section, and allowing the extension to be pivoted vertically.

Dwg.1/5

Title Terms: EAVE; TROUGH; DOWN; SPOUT; CONNECT; METHOD; INSTALLATION; **HOOK** ; PILE; **FASTEN** ; DRAIN; EXTEND; OUTER; END; DOWN; SPOUT; RAISE; EXTEND
Derwent Class: Q45
International Patent Class (Main): E04D-013/06; E04D-013/08; F16L-027/00
File Segment: EngPI

32/5/11 (Item 10 from file: 350)
DIALOG(R)File 350:Derwent WPIX

009980181 **Image available**
WPI Acc No: 1994-247895/199430
Related WPI Acc No: 1989-358961; 1993-008070
XRAM Acc No: C94-112853
XRPX Acc No: N94-195823

Blast container - comprises high tensile strength flexible sheet wound in spiral **and secured by** mating hook **and** loop fasteners

Patent Assignee: FOSTER-MILLER INC (FOSV)
Inventor: MARINACCIO P J; RIBICH W A; SAWAF B E; SMIRLOCK M E
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 5333532	A	19940802	US 88202218	A	19880603	199430	B
			US 90529196	A	19900525		
			US 92984336	A	19921202		

Priority Applications (No Type Date): US 90529196 A 19900525; US 88202218 A 19880603; US 92984336 A 19921202
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 5333532	A		10	F41H-005/16	CIP of application US 88202218
					Div ex application US 90529196
					CIP of patent US 4928575
					Div ex patent US 5170690

Abstract (Basic): US 5333532 A

A blast container (122) comprises a flexible sheet (124) of high tensile strength with separable **hook** (126) and **loop** (130) **fasteners** secured to respective surfaces. The sheet is wound in a **spiral** to form the container wall with the **fasteners** **mating** .

The sheet pref. includes aramid fibre, and each **hook** has a head projecting laterally from one side of a stem and having a latch surface between an inclined deflecting part and the stem. The **loops** are pref. formed by long lengths of continuous fibres frictionally secured through backing material to absorb large amts. of energy as they are pulled through the backing.

USE/ADVANTAGE - Partic. for use with a vehicle or system exposed to ballistic impact to substantially increase survivability.

Dwg.12/12

Title Terms: BLAST; CONTAINER; COMPRISE; HIGH; TENSILE; STRENGTH; FLEXIBLE; SHEET; WOUND; **SPIRAL** ; SECURE; MATE; **HOOK** ; **LOOP** ; **FASTEN**
Derwent Class: A95; Q79
International Patent Class (Main): F41H-005/16
File Segment: CPI; EngPI

32/5/12 (Item 11 from file: 350)
DIALOG(R)File 350:Derwent WPIX

009554856 **Image available**
WPI Acc No: 1993-248403/199331
XRPX Acc No: N93-191226

Fastening **clasp - has two identical plate elements with a** hook **at one end and retaining** loop **at the other facing one another at 180 deg.**

Patent Assignee: VEREMII A N (VERE-I)
Inventor: VEREMII A N
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
SU 1750643	A1	19920730	SU 4733225	A	19890829	199331	B

Priority Applications (No Type Date): SU 4733225 A 19890829
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
SU 1750643	A1		3	A44B-013/00	

Abstract (Basic): SU 1750643 A

Clasp comprises two identical parts in the form of plates (1) each of which has a **hook** (3) at one end. The **bend** of each **hook** (3) has a through hole (5), together with a **fastening** element in the form of a **loop** (2) at the free end of plate (1). The **hooks** (3) of adjacent **mating** plates (1) face one another at 180 deg allowing **hooks** (3) to be **fastened** into the **loops** (2) of **mating** plates (1). The two sections of the clasp require only a small amount of movement to be **fastened** together.

ADVANTAGE - Increases convenience in use. Bul.28/30.7.92

Dwg.6/7

Title Terms: **FASTEN** ; CLASP; TWO; IDENTICAL; PLATE; ELEMENT; **HOOK** ; ONE; END; RETAIN; **LOOP** ; FACE; ONE; DEGREE
Derwent Class: P23
International Patent Class (Main): A44B-013/00
International Patent Class (Additional): A44B-011/00
File Segment: EngPI

32/5/13 (Item 12 from file: 350)
DIALOG(R)File 350:Derwent WPIX

008921607 **Image available**
WPI Acc No: 1992-048876/199206
XRPX Acc No: N92-037243

Display holder for use e.g. with TV - comprises transparent plastics sheet with 180 deg bend **to hold advertising sheet and clamp for book or magazine**

Patent Assignee: DAHL R M (DAHL-I)
Inventor: DAHL R M
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 5082229	A	19920121	US 90547865	A	19900702	199206	B

Priority Applications (No Type Date): US 90547865 A 19900702

Abstract (Basic): US 5082229 A

The display holder is constructed of transparent plastic formed with an 180 deg **bend** (12) so that its face side (11) presses against its reverse side (13). The pressure of the two sides will hold a sheet of paper printed with advertising that pertains to a consumer's electronic home entertainment centre. At the opposite end, another longer-radius 180 deg **bend** (16) is made, forming a book or magazine pocket and clamp (17).

This pocket and clamp (17) can then hold a book or magazine that is used in conjunction with an electronic home entertainment centre. **Hook** -and- **loop** strips (14,15) are **fastened** to the display holder adjacent and parallel to the 180 deg **bend** (12). Then **mating** **hook** -and- **loop** strips (24) are **fastened** by e the consumer to electronic remote control units, so that these strips will mate together with the other strips.

ADVANTAGE - Allows a home owner to **fasten** remote control units to the display holder, thus consolidating them for ease of use.

Dwg.1/3

Title Terms: DISPLAY; HOLD; TELEVISION; COMPRISE; TRANSPARENT; PLASTICS; SHEET; DEGREE; **BEND** ; HOLD; ADVERTISE; SHEET; CLAMP; BOOK; MAGAZINE
Derwent Class: P27; W03
International Patent Class (Additional): A47F-005/00
File Segment: EPI; EngPI

32/5/14 (Item 13 from file: 350)
DIALOG(R)File 350:Derwent WPIX

008388250 **Image available**
WPI Acc No: 1990-275251/199036
XRPX Acc No: N90-212854

Padded retainer for spectacles - has pair of soft tubular portions which fit over downwardly curved rear ends of bows

Patent Assignee: MURRELL E E (MURR-I)
Inventor: MURRELL E E
Number of Countries: 031 Number of Patents: 004
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 9009609	A	19900823				199036	B
AU 9053594	A	19900905				199048	
US 5002381	A	19910326	US 89455514	A	19891221	199115	
US 34836	E	19950124	US 89312889	A	19890217	199510	
			US 89455514	A	19891221		
			US 9338678	A	19930326		

Priority Applications (No Type Date): US 89455514 A 19891221; US 89312889 A

19890217
Cited Patents: DE 376978; US 2229568; US 2626538; US 4657364
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 9009609	A				

Designated States (National): AT AU BB BG BR CH DE DK FI GB HU JP KP KR LK LU MC MG MW NL NO RO SD SE SU
Designated States (Regional): AT BE CH DE DK ES FR GB IT LU NL OA SE

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 34836	E		13	G02C-005/14	CIP of application US 89312889 Reissue of patent US 5002381

Abstract (Basic): WO 9009609 A
The eyewear retainer has an extender (16) of resiliently flexible and elastic material and it is attached in a selected position. The extender has a tubular part (22) adapted to fit around the terminal part and it has front and rear ends. **Hooks** are also provided which have a flexible elongate forwardly concave **hook** (24). The tubular part is at least four times as long as its own transverse dimension.

The tubular part is also straighter than the downwardly curved terminal part of the bow. The walls of the tubular part are thin so that they bulge.

ADVANTAGE - Gives extra security for wearer. (32pp Dwg.No.17/24
Title Terms: PAD; RETAIN; SPECTACLE; PAIR; SOFT; TUBE; PORTION; FIT; DOWN; CURVE; REAR; END; BOW
Derwent Class: P32; P81
International Patent Class (Additional): A61F-009/02; G02C-005/14
File Segment: EngPI

32/5/15 (Item 14 from file: 350)
DIALOG(R)File 350:Derwent WPIX

001788033
WPI Acc No: 1977-08991Y/197705
Hook **and** loop fastener - hooks **formed by zigzag crimping filament and cutting multi** hook loops **attached to backing**
Patent Assignee: BENNETT R A (BENN-I)
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 4003110	A	19770118				197705	B

Priority Applications (No Type Date): US 71213464 A 19711229; US 77757966 A 19770110

Abstract (Basic): US 4003110 A
The **hooks** are made by forming a continuous filament into zigzag **hook** sections facing in both directions by **bending** into straight sections connected by straight return lengths at acute angles to the sections. The filament is formed into **loops** attached to a backing, with a number of **hook** sections in each **loop** , and the **loops** are severed to leave upstanding filaments carrying **hooks** .

The filament is pref. nylon and is **bent** between a pair of **mating** ratchet toothed rotating tools. The straight sections are pref. parallel, as are the return lengths.
Title Terms: **HOOK** ; **LOOP** ; **FASTEN** ; **HOOK** ; FORMING; ZIGZAG; CRIMP; FILAMENT; CUT; MULTI; **HOOK** ; **LOOP** ; ATTACH; BACKING
Derwent Class: A83; F07
International Patent Class (Additional): D02G-001/14; D06C-013/08
File Segment: CPI

32/5/16 (Item 15 from file: 350)
DIALOG(R)File 350:Derwent WPIX

001711842
WPI Acc No: 1977-E8331Y/197723
Plastics typewriter carrying arrangement - hasL shaped section with pair of straps secured on underside of carrier
Patent Assignee: LEE ORG INC RAYMOND (LEEO)
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 4026501	A	19770531				197723	B

Priority Applications (No Type Date): US 75644622 A 19751229

Abstract (Basic): US 4026501 A

The carrier is in the form of a sheet of semi-rigid plastic or lightweight metal. It is **bent** as an L-shaped section and fitted with a pair of straps that mount about the space enclosed by the arms of the sheet. Each loose strap end is fitted with a tab of **Velcro** **fastening** material thatn engages a **mating** tab fixed to the underside of the sheet.

The base arm section of the sheet may be formed with spaced holes located to engage the legs of a typewriter resting on the base arm section
Title Terms: PLASTICS; TYPEWRITER; CARRY; ARRANGE; SHAPE; SECTION; PAIR; STRAP; SECURE; UNDERSIDE; CARRY
Derwent Class: Q34
International Patent Class (Additional): B65D-071/00

37/5/1 (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX

013844509 **Image available**
WPI Acc No: 2001-328722/200134
XRAM Acc No: C01-100822
XRPX Acc No: N01-236570
Plasma display panel includes a front glass substrate having a protective layer made of carbon nanotubes
Patent Assignee: ORION ELECTRIC CO LTD (ORIO-N)
Inventor: KIM J G; KWON Y G; **KWON Y K**
Number of Countries: 022 Number of Patents: 003
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 200131673	A1	20010503	WO 2000KR1204	A	20001024	200134	B
KR 2001039031	A	20010515	KR 9947242	A	19991028	200166	
KR 2001039030	A	20010515	KR 9947241	A	19991028	200166	

Priority Applications (No Type Date): KR 9947242 A 19991028; KR 9947241 A 19991028
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 200131673	A1	E	20	H01J-017/49	
Designated States (National): CN JP US					
Designated States (Regional): AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE					
KR 2001039031	A			H01J-017/49	
KR 2001039030	A			H01J-017/49	

Abstract (Basic): WO 200131673 A1

NOVELTY - A plasma display panel includes a front glass substrate (10) having multiple transparent electrodes (12), multiple bus electrodes (14), multiple black stripes, a dielectric layer (16), and a protective layer (18). The protective layer is made of carbon **nanotubes** .

USE - As a plasma display panel.

ADVANTAGE - The carbon **nanotube** protective layer is formed on the outer surface of the protective layer, thus improving the sputtering-resistance characteristics of the protective layer, and enhances the efficiency of the discharge in the plasma display panel due to the superior coefficient of secondary electron emission. Thus, the driving voltage of the plasma display panel and the energy consumption can be lowered, thus the panel is capable of extending its use life longer.

DESCRIPTION OF DRAWING(S) - The figure shows a partially sectional view illustrating the front substrate of a plasma display panel.

Front substrate (10)
Transparent electrodes (12)
Bus electrodes (14)
Dielectric layer (16)
Protective layer (18)
pp; 20 DwgNo 2/4

Title Terms: PLASMA; DISPLAY; PANEL; FRONT; GLASS; SUBSTRATE; PROTECT; LAYER; MADE; CARBON
Derwent Class: L03; V05
International Patent Class (Main): H01J-017/49
International Patent Class (Additional): H01J-009/02; H01J-011/02
File Segment: CPI; EPI

37/5/2 (Item 2 from file: 350)
DIALOG(R)File 350:Derwent WPIX

013386293 **Image available**
WPI Acc No: 2000-558231/200051
XRAM Acc No: C00-166214
XRPX Acc No: N00-413111

Charged carbon nanotubes **used in nanoscale memory devices, includes charged C60 fullerene molecules disposed in cavity of conductive and non-conductive carbon** nanotubes

Patent Assignee: UNIV MICHIGAN STATE (UNMS); BREHOB M W (BREH-I); ENBODY R (ENBO-I); TOMANEK D (TOMA-I); YOUNG-KYUN K (YOUN-I)
Inventor: BREHOB M W; **ENBODY R** ; **TOMANEK D** ; YOUNG-KYUN K
Number of Countries: 091 Number of Patents: 004
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 200048195	A1	20000817	WO 2000US3573	A	20000211	200051	B
AU 200036981	A	20000829	AU 200036981	A	20000211	200062	
EP 1157386	A1	20011128	EP 2000915760	A	20000211	200201	
			WO 2000US3573	A	20000211		
US 20020027819	A1	20020307	US 99120023	P	19990212	200221	
			WO 2000US3573	A	20000211		
			US 2001927086	A	20010809		

Priority Applications (No Type Date): US 99120023 P 19990212; US 2001927086 A 20010809
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 200048195	A1	E	44	G11C-007/00	

Designated States (National): AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CU CZ DE DK DM EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
Designated States (Regional): AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SL SZ TZ UG ZW

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
AU 200036981	A			G11C-007/00	Based on patent WO 200048195
EP 1157386	A1	E		G11C-007/00	Based on patent WO 200048195

Designated States (Regional): AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 20020027819	A1			G11C-007/00	Provisional application US 99120023
					Cont of application WO 2000US3573

Abstract (Basic): WO 200048195 A1

NOVELTY - A charged element is comprised of conductive and non-conductive C480 **nanotubes** provided with a cavity in which charged C60 fullerene molecules are disposed. The fullerene molecules are activated to move, to switch memory state.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(i) a nanoscale memory element which includes a laser source comprising electrodes connected between **nanotubes** and power source. The electrodes are equidistantly arranged to apply electric field to the **nanotubes** . The variation in electrical resistance of the memory element, due to movement of the fullerene molecule by applied electric field, near conductive and non-conductive segment is measured in middle and other electrodes to determine state of the memory element. Alternatively, a scanning probe microscope is used for activating fullerene molecules for detecting the state of the fullerene molecule and optical properties of the memory element; and

(ii) a nanoscale memory device which includes array of memory elements to store at least an bit of information. The memory element array includes conducting electrodes made of metals, polysilicon and conductive **nanotubes** and conduct electrical signals for addressing the information and change state of **nanotubes** . The number of

electrodes is approximately proportional to the square root of the number of bits stored. The electrodes transmit the information to the computer for analysis.

USE - For nanoscale non-volatile memory device. Also for fabricating decoder, multiplexer.

ADVANTAGE - The total charge transfer is increased by the array of **nanotube** assemblies, hence measurement of current is more accurate. As the graphite **nanotube** has high heat conductivity and melting point, modest heat evolved by kinetic energy of molecules does not cause significant damage to memory even at high access rate. Mass production of memory device is enhanced in cost effective manner, due to affinity of **nanotubes** and fullerene molecules to form ordered, close packed array.

DESCRIPTION OF DRAWING(S) - The figure shows the schematic view of circuitry used to address the nanoscale memory device.

pp; 44 DwgNo 11/17

Title Terms: CHARGE; CARBON; MEMORY; DEVICE; CHARGE; MOLECULAR; DISPOSABLE; CAVITY; CONDUCTING; NON; CONDUCTING; CARBON

Derwent Class: E36; L02; L03; U12; U14

International Patent Class (Main): G11C-007/00

International Patent Class (Additional): G11C-011/00

File Segment: CPI; EPI

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File   2:INSPEC 1969-2002/May W1
         (c) 2002 Institution of Electrical Engineers
File   6:NTIS 1964-2002/May W2
         (c) 2002 NTIS, Intl Cpyrght All Rights Res
File   8:Ei Compendex(R) 1970-2002/May W1
         (c) 2002 Engineering Info. Inc.
File  14:Mechanical Engineering Abs 1973-2002/May
         (c) 2002 Cambridge Sci Abs
File  25:Weldasearch 1966-2002/Nov
         (c) 2002 TWI Ltd
File  31:World Surface Coatings Abs 1976-2002/Apr
         (c) 2002 Paint Research Assn.
File  32:METADEX(R) 1966-2002/Jun B2
         (c) 2002 Cambridge Scientific Abs
File  33:Aluminium Ind Abs 1968-2002/May
         (c) 2002 Cambridge Scientific Abs
File  34:SciSearch(R) Cited Ref Sci 1990-2002/May W1
         (c) 2002 Inst for Sci Info
File  35:Dissertation Abs Online 1861-2002/Apr
         (c) 2002 ProQuest Info&Learning
File  63:Transport Res(TRIS) 1970-2002/Apr
         (c) fmt only 2002 Dialog Corp.
File  65:Inside Conferences 1993-2002/Apr W4
         (c) 2002 BLDSC all rts. reserv.
File  87:TULSA (Petroleum Abs) 1965-2002/May W2
         (c)2002 The University of Tulsa
File  94:JICST-EPlus 1985-2002/Mar W2
         (c)2002 Japan Science and Tech Corp(JST)
File  95:TEME-Technology & Management 1989-2002/APR W2
         (c) 2002 FIZ TECHNIK
File  96:FLUIDEX 1972-2002/Apr
         (c) 2002 Elsevier Science Ltd.
File  99:Wilson Appl. Sci & Tech Abs 1983-2002/Mar
         (c) 2002 The HW Wilson Co.
File 103:Energy SciTec 1974-2002/Apr B2
         (c) 2002 Contains copyrighted material
File 108:AEROSPACE DATABASE 1962-2002/APR
         (c) 2002 AIAA
File 118:ICONDA-Intl Construction 1976-2002/Apr
         (c) 2002 Fraunhofer-IRB
File 144:Pascal 1973-2002/May W1
         (c) 2002 INIST/CNRS
File 238:Abs. in New Tech & Eng. 1981-2002/Apr
         (c) 2002 Reed-Elsevier (UK) Ltd.
File 239:Mathsci 1940-2002/Jun
         (c) 2002 American Mathematical Society
File 240:PAPERCHEM 1967-2002/Apr W2
         (c) 2002 IPST
File 248:PIRA 1975-2002May W1
         (c) 2002 Pira International
File 293:Eng Materials Abs(R) 1986-2002/May
         (c) 2002 Cambridge Scientific Abs
File 315:ChemEng & Biotec Abs 1970-2002/Dec
         (c) 2002 DECHEMA
File 323:RAPRA Rubber & Plastics 1972-2002/May
          (c) 2002 RAPRA Technology Ltd
File 335:Ceramic Abstracts 1976-2002/Q1
         (c) 2002 Cambridge Scientific Abs.
File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec
         (c) 1998 Inst for Sci Info

Set     Items   Description
S1      23075   NANOTUBE?
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S2	4425	MULTI()WALL? ? OR MULTIWALL? OR MULTI-WALL? ?
S3	5	MICROFASTEN? OR MICRO()FASTEN? OR MICRO-FASTEN?
S4	56020	FASTEN?
S5	547	HOOK? ? AND LOOP? ?
S6	628	VELCRO?
S7	140231	SPIRAL?
S8	1666603	DEFORM? OR BEND OR BENDS OR BENDAB? OR BENDING OR BENT
S9	292719	NON()LINEAR OR NON-LINEAR
S10	5782881	METALS OR CARBON OR SILICON OR GERMANIUM OR POLYMERS
S11	18	REUSAB?(3N)FASTENER?
S12	72003	MATING
S13	62996	MICROTUB? OR MICRO()(TUBE? OR TUBULAR)
S14	0	NANOVELCRO? OR NANO-VELCRO? OR NANO()VELCRO?
S15	1	NANOSCALE AND (FASTENING OR FASTENER?)
S16	2109	S1 AND S2
S17	134	S16 AND (S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S11 OR - S12)
S18	134	S17 AND S10
S19	0	S18 AND (S5 OR S6)
S20	123	S18/TI
S21	9731330	PD>19990211 OR PY>1999
S22	46	S20 NOT S21
S23	19	RD (unique items)
S24	19	S23 NOT S15
S25	0	S1 AND (S3 OR S4) AND S12
S26	0	S1 AND S12
S27	0	S1 AND (S5 OR S6)
S28	2	S13 AND (S5 OR S6)
S29	2	RD (unique items)
S30	2	S29 NOT (S15 OR S23)
S31	238	AU="TOMANEK D" OR AU="TOMANEK D." OR AU="TOMANEK DAVID"
S32	254	AU="TOMANEK, D" OR AU="TOMANEK, D." OR AU="TOMANEK, DAVID"
S33	97	AU="ENBODY R" OR AU="ENBODY R J" OR AU="ENBODY RJ" OR AU="-ENBODY, R" OR AU="ENBODY, R." OR AU="ENBODY, R. J" OR AU="ENB-ODY, R. J." OR AU="ENBODY, R.J." OR AU="ENBODY, RICHARD" OR A-U="ENBODY, RICHARD J." OR AU="ENBODY, RICHARD JAMES"
S34	10	AU="KWON YOUNG-KYUN"
S35	3	AU="KWON Y-K"
S36	66	AU="KWON Y K"
S37	603	S31:S36
S38	134	S37 AND (S1 OR S2 OR S3 OR S4 OR S13)
S39	133	S38 AND S1
S40	34	S39 AND (S2 OR S3 OR S11 OR S12)
S41	18	RD (unique items)
S42	18	S41 NOT (S15 OR S23 OR S29)
S43	11	S42 NOT S21
S44	7	S42 NOT S43

15/3,AB/1 (Item 1 from file: 95)
DIALOG(R)File 95:TEME-Technology & Management

01612228 20020206667
Selective DNA attachment of micro- and nanoscale **particles to substrates**
(Selektive DNA-Anlagerung (Befestigung) von Mikro- und Nanoteilchen an Substrate)
Hartmann, DM; Heller, M; Esener, SC; Schwartz, D; Tu, G
Univ. of California, San Diego, USA; Solulink, San Diego, USA; GenOptix, San Diego, USA
Journal of Materials Research, v17, n2, pp473-478, 2002
Document type: journal article Language: English
Record type: Abstract
ISSN: 0884-2914

ABSTRACT:
Materials formed from micro- and **nanoscale** particles are of interest because they often exhibit novel optical, electrical, magnetic, chemical, or mechanical properties. In this work, a means of constructing particulate materials using DNA strands to selectively attach micro- and nanoparticles to substrates was demonstrated. Unlike previous schemes, the DNA was anchored covalently to the particles and substrates, rather than through protein intermediaries. Highly reproducible selective attachment of 0.11 - 0.87 micrometer-diameter particles was achieved, with selective:nonselective binding ratios > 20:1. Calculations showed that at most 350 and 4200 DNA strands were involved in the binding of the small and large particles, respectively. Experiments showed that the DNA was bent at an angle, relative to the surfaces of their solid supports

24/3,AB/1 (Item 1 from file: 2)
DIALOG(R)File 2:INSPEC

6742878 INSPEC Abstract Number: A2000-23-6148-044
Title: Sliding, stretching, and tapering: recent structural results for carbon nanotubes
Author(s): Crespi, V.H.; Peihong Zhang; Lammert, P.E.
Author Affiliation: Dept. of Phys., Pennsylvania State Univ., University Park, PA, USA
Journal: AIP Conference Proceedings Conference Title: AIP Conf. Proc. (USA) no.486 p.364-8
Publisher: AIP,
Publication Date: 1999 Country of Publication: USA
CODEN: APCPCS ISSN: 0094-243X
SICI: 0094-243X(1999)486L.364:SSTR;1-O
Material Identity Number: A210-1999-050
U.S. Copyright Clearance Center Code: 0094-243X/99/$15.00
Conference Title: Electronic Properties of Novel Materials - Science and Technology of Molecular Nanostructures. 13th International Winterschool
Conference Sponsor: Aventi Res. & Technol.; AVL LIST GmbH; BRUKER Analytischer Messyechnik GmbH; et al
Conference Date: 27 Feb.-6 March 1999 Conference Location: Kirchberg, Austria
Language: English
Abstract: Typical multiwalled carbon tubes have interlayer incommensuration both azimuthally and axially. Finite size effects then imply that the maximal energetic barrier to interlayer sliding in nanoscale multiwalled carbon nanotubes is, surprisingly, independent of the size of the system. Turning attention from post-synthesis interwall interactions to interwall fluctuations during growth, we note that certain thermal fluctuations during multiwalled nanotube growth and tapering are locked into the final structure. The thermal dispersion in the diameters of tube endcaps reveals that multiwalled nanotubes grow at temperatures much lower than the maximum plasma temperatures for the are discharge. Finally, considering only noncatastrophic structural distortions (i.e. plastic as opposed to brittle failure under tensile load), the onset of plastic deformation in carbon nanotubes depends very strongly on the wrapping index, as can be understood from a simple model of index-dependent defect-induced lengthening of the tube.
Subfile: A

24/3,AB/2 (Item 2 from file: 2)
DIALOG(R)File 2:INSPEC

6577648 INSPEC Abstract Number: A2000-11-6220F-020
Title: Spring-like behaviour of carbon nanotubes **observed by transmission electron microscopy**
Author(s): Knechtel, W.H.; Dusberg, G.S.; Blau, W.J.
Author Affiliation: Trinity Coll., Dublin, Ireland
Journal: AIP Conference Proceedings Conference Title: AIP Conf. Proc. (USA) no.442 p.97-100
Publisher: AIP,
Publication Date: 1998 Country of Publication: USA
CODEN: APCPCS ISSN: 0094-243X
SICI: 0094-243X(1998)442L.97:SLBC;1-R
Material Identity Number: A210-2000-020
U.S. Copyright Clearance Center Code: 0094-243X/98/$15.00
Conference Title: Electronic Properties of Novel Materials - Progress in Molecular Nanostructures. XI International Wintershcool

Conference Date: March 1998 Conference Location: Kirchberg Tyrol, Austria
Language: English
Abstract: Multi-wall carbon nanotubes can be bent by changing the current density of the electron beam in a TEM. The effect could be observed in a small fraction of nanotubes in all of the investigated samples. The bending can be varied continuously, is reversible and highly reproducible. On removing the force which make them bend, they relax to their originally straight shape without any damage, thus exhibiting spring-like behaviour. We estimate the force which is applied to such a bending tube.
Subfile: A

24/3,AB/3 (Item 3 from file: 2)
DIALOG(R)File 2:INSPEC

6420895 INSPEC Abstract Number: A2000-01-6825-008
Title: Molecular dynamics of carbon **nanotubule proximal probe tip-surface contacts**
Author(s): Garg, A.; Sinnott, S.B.
Author Affiliation: Dept. of Chem. & Mater. Eng., Kentucky Univ., Lexington, KY, USA
Journal: Physical Review B (Condensed Matter) vol.60, no.19 p. 13786-91
Publisher: APS through AIP,
Publication Date: 15 Nov. 1999 Country of Publication: USA
CODEN: PRBMDO ISSN: 0163-1829
SICI: 0163-1829(19991115)60:19L.13786:MDCN;1-E
Material Identity Number: P279-1999-043
U.S. Copyright Clearance Center Code: 0163-1829/99/60(19)/13786(6)/$15.00
Language: English
Abstract: The mechanisms by which carbon nanotubule (CNT) proximal probe tips deform during the indentation of surfaces are explored using classical molecular-dynamics simulations. The forces acting on the atoms in the simulations are calculated using the Brenner empirical bond-order potential for hydrocarbons. The results show that open and capped single-walled CNT tips indented against hydrogen-terminated diamond and graphene surfaces buckle and slip to relieve the applied stress. The study also examines the indentation of capped multiwalled tubules against these surfaces to investigate the effect of multiple shells on the deformation process. It is found that while shell-shell interactions have little effect on the deformation mechanisms, the multiwalled tubule is significantly stiffer than comparably sized single-walled tubules. No bond formation between the shells is predicted as a result of deformation. Finally, a small CNT rope is indented against diamond and graphene to assess the effect of intertubule interactions on deformation. The simulations reveal how the deformation of the rope leads to the distortion of its end and allow for the determination of the effect of shear stress within the bundle on the buckling force of the rope.
Subfile: A

24/3,AB/4 (Item 4 from file: 2)
DIALOG(R)File 2:INSPEC

6395627 INSPEC Abstract Number: A1999-23-7865V-007
Title: Evolution and evaluation of the polymer/ nanotube **composite**
Author(s): Curran, S.; Davey, A.P.; Coleman, J.; Dalton, A.; McCarthy, B. ; Maier, S.; Drury, A.; Gray, D.; Brennan, M.; Ryder, K.; Lamy de la

Chapelle, M.; Journet, C.; Bernier, P.; Byrne, H.J.; Carroll, D.; Ajayan, P.M.; Lefrant, S.; Balu, W.
Author Affiliation: Dept. of Phys., Trinity Coll., Dublin, Ireland
Journal: Synthetic Metals Conference Title: Synth. Met. (Switzerland) vol.103, no.1-3 p.2559-62
Publisher: Elsevier,
Publication Date: June 1999 Country of Publication: Switzerland
CODEN: SYMEDZ ISSN: 0379-6779
SICI: 0379-6779(199906)103:1/3L.2559:EEPN;1-W
Material Identity Number: S253-1999-012
U.S. Copyright Clearance Center Code: 0379-6779/99/$20.00
Conference Title: International Conference on Science and Technology of Synthetic Metals
Conference Date: 12-18 July 1998 Conference Location: Montpellier, France
Language: English
Abstract: Composite structures, using MWNT and SWNT and the polymer (PmPV) exhibit properties which enhance those of the individual components. The polymer PmPV can act as an organic filter for the multiwalled system where the MWNT are indefinitely suspended in the polymer solution while the carbonaceous material falls out of solution. Raman measurements of this show a complete reduction of the amorphous line at 1350 cm/sup -1/. We see that we can alter the luminescence quantum yield of the composite, where the effects are different depending on which nanotubes are used. When we examine the SWNT/PmPV the quantum yield is increased. The, MWNT composite also shows strong non-linear optical signal. The pristine polymer has an chi /sup (3)/ of 10/sup -11/ esu whereas the composite chi /sup (3)/ is -10/sup -/10/sub esu/.
Subfile: A

24/3,AB/5 (Item 5 from file: 2)
DIALOG(R)File 2:INSPEC

6259972 INSPEC Abstract Number: A1999-13-8140L-041
Title: Deformation **of** carbon nanotubes **in** nanotube **-polymer composites**
Author(s): Bower, C.; Rosen, R.; Jin, L.; Han, J.; Zhou, O.
Author Affiliation: Dept. of Phys. & Astron., North Carolina Univ., Chapel Hill, NC, USA
Journal: Applied Physics Letters vol.74, no.22 p.3317-19
Publisher: AIP,
Publication Date: 31 May 1999 Country of Publication: USA
CODEN: APPLAB ISSN: 0003-6951
SICI: 0003-6951(19990531)74:22L.3317:DCNN;1-J
Material Identity Number: A135-1999-021
U.S. Copyright Clearance Center Code: 0003-6951/99/74(22)/3317(3)/$15.00
Language: English
Abstract: Composites of uniaxially oriented multiwalled carbon nanotubes embedded in polymer matrices were fabricated and investigated by transmission electron microscopy. In strained composite films, buckling was ubiquitously observed in bent nanotubes with large curvatures. By analyses of a large number of bent nanotubes, the onset buckling strain and fracture strain were estimated to be approximately=5% and >or=18%, respectively. The buckling wavelengths are proportional to the dimensions of the nanotubes. Examination of the fracture surface showed adherence of the polymer to the nanotubes.
Subfile: A

24/3,AB/6 (Item 6 from file: 2)
DIALOG(R)File 2:INSPEC

6250383 INSPEC Abstract Number: A1999-12-6220D-006
Title: Electrostatic deflections and electromechanical resonances of carbon nanotubes
Author(s): Poncharal, P.; Wang, Z.L.; Ugarte, D.; De Heer, W.A.
Author Affiliation: Sch. of Phys., Georgia Inst. of Technol., Atlanta, GA, USA
Journal: Science vol.283, no.5407 p.1513-16
Publisher: American Assoc. Adv. Sci,
Publication Date: 5 March 1999 Country of Publication: USA
CODEN: SCIEAS ISSN: 0036-8075
SICI: 0036-8075(19990305)283:5407L.1513:EDER;1-D
Material Identity Number: S015-1999-011
U.S. Copyright Clearance Center Code: 0036-8075/99/$4.00
Language: English
Abstract: Static and dynamic mechanical deflections were electrically induced in cantilevered, multiwalled carbon nanotubes in a transmission electron microscope. The nanotubes were resonantly excited at the fundamental frequency and higher harmonics as revealed by their deflected contours, which correspond closely to those determined for cantilevered elastic beams. The elastic bending modulus as a function of diameter was found to decrease sharply (from about 1 to 0.1 terapascals) with increasing diameter (from 8 to 40 nanometers), which indicates a crossover from a uniform elastic mode to an elastic mode that involves wavelike distortions in the nanotube. The quality factors of the resonances are on the order of 500. The methods developed here have been applied to a nanobalance for nanoscopic particles and also to a Kelvin probe based on nanotubes.
Subfile: A

24/3,AB/7 (Item 7 from file: 2)
DIALOG(R)File 2:INSPEC

6187651 INSPEC Abstract Number: A1999-08-6220F-012
Title: Direct atomistic observation of deformation **in** multiwalled carbon nanotubes
Author(s): Kizuka, T.
Author Affiliation: Dept. of Appl. Phys., Nagoya Univ., Japan
Journal: Physical Review B (Condensed Matter) vol.59, no.7 p.4646-9
Publisher: APS through AIP,
Publication Date: 15 Feb. 1999 Country of Publication: USA
CODEN: PRBMDO ISSN: 0163-1829
SICI: 0163-1829(19990215)59:7L.4646:DAOD;1-1
Material Identity Number: P279-1999-007
U.S. Copyright Clearance Center Code: 0163-1829/99/59(7)/4646(4)/$15.00
Language: English
Abstract: The deformation process of individual multiwalled carbon nanotubes was directly observed by time-resolved high-resolution transmission electron microscopy using a piezo-driving specimen holder at a spatial resolution of 0.2 nm and a time resolution of 1/60 s. High elasticity and the subsequent atomistic damage process of the nanotubes were demonstrated.
Subfile: A

24/3,AB/8 (Item 8 from file: 2)
DIALOG(R)File 2:INSPEC

6173346 INSPEC Abstract Number: A1999-07-6220D-003
Title: Elastic and shear moduli of single-walled carbon nanotube **ropes**
Author(s): Salvetat, J.-P.; Briggs, G.A.D.; Bonard, J.-M.; Bacsa, R.R.; Kulik, A.J.
Author Affiliation: Dept. de Phys., Ecole Polytech. Fed. de Lausanne, Switzerland
Journal: Physical Review Letters vol.82, no.5 p.944-7
Publisher: APS,
Publication Date: 1 Feb. 1999 Country of Publication: USA
CODEN: PRLTAO ISSN: 0031-9007
SICI: 0031-9007(19990201)82:5L.944:ESMS;1-8
Material Identity Number: P096-1999-007
U.S. Copyright Clearance Center Code: 0031-9007/99/82(5)/944(4)$15.00
Language: English
Abstract: Carbon nanotubes are believed to be the ultimate low-density high-modulus fibers, which makes their characterization at nanometer scale vital for applications. By using an atomic force microscope and a special substrate, the elastic and shear moduli of individual single-walled nanotube (SWNT) ropes were measured to be of the order of 1 TPa and 1 GPa, respectively. In contrast to multiwalled nanotubes, an unexpectedly low intertube sheer stiffness dominated the flexural behavior of the SWNT ropes. This suggests that intertube cohesion should be improved for applications of SWNT ropes in high-performance composite materials.
Subfile: A

24/3,AB/9 (Item 9 from file: 2)
DIALOG(R)File 2:INSPEC

6101875 INSPEC Abstract Number: A9902-6148-007
Title: Deformation **of** carbon nanotubes **by surface van der Waals forces**
Author(s): Hertel, T.; Walkup, R.E.; Avouris, P.
Author Affiliation: IBM Thomas J. Watson Res. Center, Yorktown Heights, NY, USA
Journal: Physical Review B (Condensed Matter) vol.58, no.20 p. 13870-3
Publisher: APS through AIP,
Publication Date: 15 Nov. 1998 Country of Publication: USA
CODEN: PRBMDO ISSN: 0163-1829
SICI: 0163-1829(19981115)58:20L.13870:DCNS;1-4
Material Identity Number: P279-98045
U.S. Copyright Clearance Center Code: 0163-1829/98/58(20)/13870(4)/$15.00
Language: English
Abstract: The strength and effect of surface van der Waals forces on the shape of multiwalled and single-walled carbon nanotubes is investigated using atomic-force microscopy, continuum mechanics, and molecular-mechanics simulations. Our calculations show that depending on the tube diameter and number of shells, the van der Waals interaction between nanotubes and a substrate results in high binding energies, which has also been determined experimentally. Nanotubes on a substrate may consequently experience radial and axial deformations, which significantly modify the idealized geometry of free nanotubes. These findings have implications for electronic transport and the tribological properties of adsorbed nanotubes.
Subfile: A

24/3,AB/10 (Item 10 from file: 2)

6062805 INSPEC Abstract Number: B9812-2230-005
Title: Single- and multi - wall carbon nanotube **field-effect transistors**
Author(s): Martel, R.; Schmidt, T.; Shea, H.R.; Hertel, T.; Avouris, Ph.
Author Affiliation: IBM Thomas J. Watson Res. Center, Yorktown Heights, NY, USA
Journal: Applied Physics Letters vol.73, no.17 p.2447-9
Publisher: AIP,
Publication Date: 26 Oct. 1998 Country of Publication: USA
CODEN: APPLAB ISSN: 0003-6951
SICI: 0003-6951(19981026)73:17L.2447:SMWC;1-7
Material Identity Number: A135-98043
U.S. Copyright Clearance Center Code: 0003-6951/98/73(17)/2447(3)/$15.00
Language: English
Abstract: We fabricated field-effect transistors based on individual single- and multi-wall carbon nanotubes and analyzed their performance. Transport through the nanotubes is dominated by holes and, at room temperature, it appears to be diffusive rather than ballistic. By varying the gate voltage, we successfully modulated the conductance of a single-wall device by more than 5 orders of magnitude. Multi-wall nanotubes show typically no gate effect, but structural deformations-in our case a collapsed tube-can make them operate as field-effect transistors.
Subfile: B

24/3,AB/11 (Item 11 from file: 2)

6044092 INSPEC Abstract Number: A9822-6220D-007
Title: Evaluation of Young's modulus of carbon nanotubes **by micro-Raman spectroscopy**
Author(s): Lourie, O.; Wagner, H.D.
Author Affiliation: Dept. of Mater. Res., Weizmann Inst. of Sci., Rehovot, Israel
Journal: Journal of Materials Research vol.13, no.9 p.2418-22
Publisher: Mater. Res. Soc,
Publication Date: Sept. 1998 Country of Publication: USA
CODEN: JMREEE ISSN: 0884-2914
SICI: 0884-2914(199809)13:9L.2418:EYMC;1-2
Material Identity Number: I870-98010
U.S. Copyright Clearance Center Code: 0884-2914/98/$2.50
Language: English
Abstract: Micro-Raman spectroscopy is used to monitor the cooling-induced compressive deformation of carbon nanotubes embedded in an epoxy matrix. Young's modulus of single- and multiwall nanotubes may then be derived from a concentric cylinder model for thermal stresses, using the D*-band shift for each tube type. The resulting values of the elastic moduli are in very good agreement with predicted theoretical values, and with the published experimental data set of Treacy et al., Nature (London) 381, 678 (1996).
Subfile: A

24/3,AB/12 (Item 12 from file: 2)

6041298 INSPEC Abstract Number: A9822-6146-001

Title: Reversible bending **of** carbon nanotubes **using a transmission electron microscope**
Author(s): Knechtel, W.H.; Dusberg, G.S.; Blau, W.J.; Hernandez, E.; Rubio, A.
Author Affiliation: Dept. of Phys., Trinity Coll., Dublin, Ireland
Journal: Applied Physics Letters vol.73, no.14 p.1961-3
Publisher: AIP,
Publication Date: 5 Oct. 1998 Country of Publication: USA
CODEN: APPLAB ISSN: 0003-6951
SICI: 0003-6951(19981005)73:14L.1961:RBCN;1-C
Material Identity Number: A135-98041
U.S. Copyright Clearance Center Code: 0003-6951/98/73(14)/1961(3)/$15.00
Language: English
Abstract: Multiwall carbon nanotubes can be bent by changing the current density of the electron beam in a transmission electron microscope. The effect could be observed in a small fraction of nanotubes in the investigated samples. The bending can be varied continuously, is reversible, and highly reproducible. On removing the force which makes them bend, they relax to their originally straight shape without any damage, thus exhibiting spring-like behavior. Possible mechanisms for this effect are discussed.
Subfile: A
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24/3,AB/13 (Item 13 from file: 2)
DIALOG(R)File 2:INSPEC
(c) 2002 Institution of Electrical Engineers. All rts. reserv.

6031755 INSPEC Abstract Number: A9821-6146-030
Title: Buckling and collapse of embedded carbon nanotubes
Author(s): Lourie, O.; Cox, D.M.; Wagner, H.D.
Author Affiliation: Dept. of Mater. & Interfaces, Weizmann Inst. of Sci., Rehovot, Israel
Journal: Physical Review Letters vol.81, no.8 p.1638-41
Publisher: APS,
Publication Date: 24 Aug. 1998 Country of Publication: USA
CODEN: PRLTAO ISSN: 0031-9007
SICI: 0031-9007(19980824)81:8L.1638:BCEC;1-7
Material Identity Number: P096-98035
U.S. Copyright Clearance Center Code: 0031-9007/98/81(8)/1638(4)$15.00
Language: English
Abstract: Experimental observations of various deformation and fracture modes under compression of single multiwalled carbon nanotubes, obtained as a result of embedment within a polymeric film, are reported. Based on a combination of experimental measurements and the theory of elastic stability, the compressive strengths of thin- and thick-walled nanotubes are round to be about 2 orders of magnitude higher than the compressive strength of any known fiber.
Subfile: A
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24/3,AB/14 (Item 14 from file: 2)
DIALOG(R)File 2:INSPEC
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5928768 INSPEC Abstract Number: A9813-6146-030
Title: Manipulation of individual carbon nanotubes **and their interaction with surfaces**
Author(s): Hertel, T.; Martel, R.; Avouris, P.
Author Affiliation: IBM Thomas J. Watson Res. Center, Yorktown Heights, NY, USA

Journal: Journal of Physical Chemistry B vol.102, no.6 p.910-15
Publisher: ACS,
Publication Date: 5 Feb. 1998 Country of Publication: USA
CODEN: JPCBFK ISSN: 1089-5647
SICI: 1089-5647(19980205)102:6L.910:MICN;1-6
Material Identity Number: G111-98007
U.S. Copyright Clearance Center Code: 1089-5647/98/$15.00
Language: English
Abstract: We demonstrate that the tip of an atomic force microscope (AFM) can be used to control the shape and position of individual multiwalled carbon nanotubes dispersed on a surface. Specifically we can bend, straighten, translate, rotate, and-under certain conditions-cut nanotubes. Such manipulations are feasible due to the interaction between nanotubes and the substrate, which can stabilize highly strained nanotube configurations. Direct evidence for this interaction is provided by the study of elastic distortions of tubes interacting with other tubes and the substrate. From the observed deformations of nanotubes with 100 AA diameter, for example, we obtain a binding energy of 0.8+or-0.3 eV/AA. This interaction forces nanotubes to conform to the structure of the substrate, and the resulting distortions should induce corresponding changes in their electronic structure and electrical transport properties.
Subfile: A

24/3,AB/15 (Item 15 from file: 2)
DIALOG(R)File 2:INSPEC

5765327 INSPEC Abstract Number: A9801-6146-025
Title: Nanobeam mechanics: elasticity, strength and toughness of nanorods and nanotubes
Author(s): Wong, E.W.; Sheehan, P.E.; Lieber, C.M.
Author Affiliation: Dept. of Chem., Harvard Univ., Cambridge, MA, USA
Journal: Science vol.277, no.5334 p.1971-5
Publisher: American Assoc. Adv. Sci,
Publication Date: 26 Sept. 1997 Country of Publication: USA
CODEN: SCIEAS ISSN: 0036-8075
SICI: 0036-8075(19970926)277:5334L.1971:NMES;1-Z
Material Identity Number: S015-97040
U.S. Copyright Clearance Center Code: 0036-8075/97/$4.00
Language: English
Abstract: The Young's modulus, strength, and toughness of nanostructures are important to proposed applications ranging from nanocomposites to probe microscopy, yet there is little direct knowledge of these key mechanical properties. Atomic force microscopy was used to determine the mechanical properties of individual, structurally isolated silicon carbide (SiC) nanorods (NRs) and multiwall carbon nanotubes (MWNTs) that were pinned at one end to molybdenum disulfide surfaces. The bending force was measured versus displacement along the unpinned lengths. The MWNTs were about two times as stiff as the SiC NRs. Continued bending of the SiC NRs ultimately led to fracture, whereas the MWNTs exhibited an interesting elastic buckling process. The strengths of the SiC NRs were substantially greater than those found previously for larger SiC structures, and they approach theoretical values. Because of buckling, the ultimate strengths of the stiffer MWNTs were less than those of the SiC NRs, although the MWNTs represent a uniquely tough, energy-absorbing material.
Subfile: A

24/3,AB/16 (Item 16 from file: 2)
DIALOG(R)File 2:INSPEC

5758119 INSPEC Abstract Number: A9801-6220F-007
Title: Bending **and buckling of** carbon nanotubes **under large strain**
Author(s): Falvo, M.R.; Clary, G.J.; Taylor, R.M., II; Chi, V.; Brooks, F.P., Jr; Washburn, S.; Superfine, R.
Author Affiliation: Dept. of Phys. & Astron., North Carolina Univ., Chapel Hill, NC, USA
Journal: Nature vol.389, no.6651 p.582-4
Publisher: Macmillan Magazines,
Publication Date: 9 Oct. 1997 Country of Publication: UK
CODEN: NATUAS ISSN: 0028-0836
SICI: 0028-0836(19971009)389:6651L.582:BBCN;1-6
Material Identity Number: N003-97042
U.S. Copyright Clearance Center Code: 0028-0836/97/$12.00+2.00
Language: English
Abstract: The curling of a graphitic sheet to form carbon nanotubes produces a class of materials that seem to have extraordinary electrical and mechanical properties. In particular, the high elastic modulus of the graphite sheets means that the nanotubes might be stiffer and stronger than any other known material, with beneficial consequences for their application in composite bulk materials and as individual elements of nanometre-scale devices and sensors. The mechanical properties are predicted to be sensitive to details of their structure and to the presence of defects, which means that measurements on individual nanotubes are essential to establish these properties. We show that multiwalled carbon nanotubes can be bent repeatedly through large angles using the tip of an atomic force microscope, without undergoing catastrophic failure. We observe a range of responses to this high-strain deformation, which together suggest that nanotubes are remarkably flexible and resilient.
Subfile: A

24/3,AB/17 (Item 17 from file: 2)
DIALOG(R)File 2:INSPEC

5249136 INSPEC Abstract Number: A9610-6480-013
Title: Nanotubes : bending **and filling. II**
Author(s): Subramoney, S.; Ruoff, R.S.; LaDuca, R.; Awadalla, S.; Parvin, K.
Author Affiliation: Central Res. & Dev., DuPont Co., Wilmington, DE, USA
Conference Title: Proceedings of the Symposium on Recent Advances in the Chemistry and Physics of Fullerenes and Related Materials p.563-9
Editor(s): Ruoff, R.S.; Kadish, K.M.
Publisher: Electrochem. Soc, Pennington, NJ, USA
Publication Date: 1995 Country of Publication: USA xv+1648 pp.
Material Identity Number: XX95-03063
Conference Title: Proceedings of Fullerenes: Chemistry, Physics and New Directions VII
Conference Date: 16-21 May 1995 Conference Location: Reno, NV, USA
Language: English
Abstract: For pt. I see ibid., vol. 95-10, p. 557-62 (1995). The deformation of carbon nanotubes subjected to semi-controlled bending experiments is examined in detail by high resolution transmission electron microscopy (TEM). As discussed in pt. I, the multi-wall carbon nanotubes were deposited on formvar-coated TEM grids. The formvar films were in turn subjected to mild shrinkage by gently heating them, causing the carbon nanotubes laying on the formvar films to undergo complex deformations. This paper reports on the preliminary findings associated with the deformation and failure of carbon nanotubes and other molecular level rigid rods.
Subfile: A

24/3,AB/18 (Item 1 from file: 99)
DIALOG(R)File 99:Wilson Appl. Sci & Tech Abs

1633184 H.W. WILSON RECORD NUMBER: BAST98016161
Chemists and their nanotubes **--IBM scientists** bend **them, shape them, any way they want to**
Jacoby, Mitch;
Chemical & Engineering News v. 76 (Feb. 16 '98) p. 4-5
DOCUMENT TYPE: Feature Article ISSN: 0009-2347

ABSTRACT: Scientists at IBM have succeeded in reshaping, moving, and cutting--at will--individual multiwalled carbon nanotubes on a solid surface. The work was carried out by postdoctoral researcher Tobias Hertel, research chemist Richard Martel, and the manager of the nanometer-scale science and technology group at IBM's T.J. Watson Research Center in New York, Phaedon Avouris. Using the tip of an atomic force microscope, the scientists conducted stepwise maneuvers to manipulate the nanotubes--molding them into various patterns. The researchers are also studying the effect of tube shape and alignment on electrical transport properties and exploring how to cut these microscopic conduits. The capacity to manipulate individual multiwalled nanotubes with nanometer-scale agility could accelerate the continuing trend toward miniaturization of electronic devices.

24/3,AB/19 (Item 1 from file: 144)
DIALOG(R)File 144:Pascal

13689832 PASCAL No.: 98-0398781
Evaluation of Young<right single quotation mark>s modulus of carbon nanotubes **by micro-Raman spectroscopy**
LOURIE O; WAGNER H D
Department of Materials and Interfaces, Weizmann Institute of Science, Rehovot 76100, Israel
Journal: Journal of materials research, 1998-09, 13 (9) 2418-2422
Language: English
Micro-Raman spectroscopy is used to monitor the cooling-induced compressive deformation of carbon nanotubes embedded in an epoxy matrix. The Young<right single quotation mark>s modulus of single- and multiwall nanotubes may then be derived from a concentric cylinder model for thermal stresses, using the D SUP * -band shift for each tube type. The resulting values of the elastic moduli are in very good agreement with predicted theoretical values, and with the only published experimental data set of Treacy <et al.>, Nature (London) 381, 678 (1996). (c) 1998 Materials Research Society.

30/3,AB/1 (Item 1 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

08361060 Genuine Article#: 276HX Number of References: 23
Title: **Mechanism of the single-headed processivity: Diffusional anchoring between the K-** loop **of kinesin and the C terminus of tubulin** (ABSTRACT AVAILABLE)
Author(s): Okada Y; Hirokawa N (REPRINT)
Corporate Source: UNIV TOKYO,DEPT CELL BIOL, GRAD SCH MED, BUNKYO KU, 7-3-1 HONGO/TOKYO 1130033//JAPAN/ (REPRINT); UNIV TOKYO,DEPT CELL BIOL, GRAD SCH MED, BUNKYO KU/TOKYO 1130033//JAPAN/
Journal: PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, 2000, V97, N2 (JAN 18), P640-645
ISSN: 0027-8424 Publication date: 20000118
Publisher: NATL ACAD SCIENCES, 2101 CONSTITUTION AVE NW, WASHINGTON, DC 20418
Language: English Document Type: ARTICLE
Abstract: A motor-domain construct of KIF1A, a single-headed kinesin superfamily protein, was demonstrated to take more than 600 steps before detaching from a **microtubule** . However, its molecular mechanism remained unclear. Here we demonstrate the nucleotide-dependent binding between the lysine-rich, highly positively charged **loop** 12 of the KIF1A motor domain (K- **loop**) and the glutamate-rich, highly negatively charged C-terminal region of tubulin (E- **hook**), This binding did not contribute in the strong binding state but only in the weak binding state. This binding was demonstrated to be essential for the single-headed processivity by functioning as the anchor for the one-dimensional simple Brownian movement in the weak binding state. This Brownian movement will allow the small KIF1A motor domain to span the distance between the binding sites on **microtubule** and also will give the diffusive nature to the movement of single KIF1A molecules. These observations quantitatively fitted well to the predictions made from our Brownian motor model on the mechanism of the single-headed processive movement.

30/3,AB/2 (Item 2 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

06145457 Genuine Article#: XX880 Number of References: 47
Title: **The fine structure of the male gamete of Ectocarpus siliculosus (Ectocarpales, Phaeophyceae) .2. The flagellar apparatus** (ABSTRACT AVAILABLE)
Author(s): Maier I (REPRINT)
Corporate Source: UNIV KONSTANZ,FAK BIOL, POSTFACH 5560/D-78457 CONSTANCE//GERMANY/ (REPRINT)
Journal: EUROPEAN JOURNAL OF PHYCOLOGY, 1997, V32, N3 (AUG), P255-266
ISSN: 0967-0262 Publication date: 19970800
Publisher: CAMBRIDGE UNIV PRESS, 40 WEST 20TH STREET, NEW YORK, NY 10011-4211
Language: English Document Type: ARTICLE
Abstract: The fine structure of the flagellar apparatus of male gametes of Ectocarpus siliculosus has been studied in negatively stained whole-mount preparations of isolated flagellar apparatuses and by transmission electron microscopy of embedded whole cells and flagellar apparatuses. Reconstructions from serial sections revealed a single absolute configuration and new structural details of the flagellar apparatus. A set of 5 **microtubular** roots is associated with the 2 flagellar basal bodies: the major anterior root consisting of 9 **microtubules** originates at the anterior basal body and **loops** through the anterior part of the cell. Cytoplasmic **microtubules** originate

from this root at the apex of the cell and splay out in a posterior direction through the cell, thus determining cell shape. A broad **microtubular** band composed of a 9-membered bypassing root and a 3-membered major posterior root runs across the basal bodies. Two additional flagellar roots, the minor anterior and minor posterior rootlets, consist of a single **microtubule** each. The proximal end of the posterior basal body is laterally connected to the anterior basal body by a cross-striated connective (deltoid band). The basal bodies are connected to the nucleus by a small rhizoplast and several other fibrous structures are associated with the basal bodies. The results are discussed in relation to earlier observations on flagellar apparatus organization in brown algae.

43/3,AB/1 (Item 1 from file: 2)
DIALOG(R)File 2:INSPEC

6577661 INSPEC Abstract Number: A2000-11-7125X-008
Title: Self-assembly and electronic structure of bundled single- and multi - wall nanotubes
Author(s): **Tomanek, D.**
Author Affiliation: Dept. of Phys. & Astron., Michigan State Univ., East Lansing, MI, USA
Journal: AIP Conference Proceedings Conference Title: AIP Conf. Proc. (USA) no.442 p.159-63
Publisher: AIP,
Publication Date: 1998 Country of Publication: USA
CODEN: APCPCS ISSN: 0094-243X
SICI: 0094-243X(1998)442L.159:SAES;1-L
Material Identity Number: A210-2000-020
U.S. Copyright Clearance Center Code: 0094-243X/98/$15.00
Conference Title: Electronic Properties of Novel Materials - Progress in Molecular Nanostructures. XI International Wintershcool
Conference Date: March 1998 Conference Location: Kirchberg Tyrol, Austria
Language: English
Abstract: The detailed growth mechanism of single-wall **nanotube** bundles and of **multiwall nanotubes** of carbon is investigated using ab initio and parametrized calculations. Our results show that single-wall tubes grow only in the presence of a catalyst; whereas **multi - wall** tubes, stabilized at the growing edge by a covalent "lip-lip" interaction. May form in a pure carbon atmosphere. The individual tubes in these systems are likely to exhibit a low-frequency twisting motion. The weak, partly anisotropic inter-wall interaction, present in single-wall **nanotube** bundles and in **multi - wall nanotubes** , may cause significant changes in the density of states near the Fermi level.
Subfile: A

43/3,AB/2 (Item 2 from file: 2)
DIALOG(R)File 2:INSPEC

6187307 INSPEC Abstract Number: A1999-08-8120V-002, C1999-04-5320-001
Title: "Bucky shuttle" memory device: synthetic approach and molecular dynamics simulations
Author(s): Kwon, Y.-K.; **Tomanek, D.** ; Iijima, S.
Author Affiliation: Dept. of Phys. & Astron., Michigan State Univ., East Lansing, MI, USA
Journal: Physical Review Letters vol.82, no.7 p.1470-3
Publisher: APS,
Publication Date: 15 Feb. 1999 Country of Publication: USA
CODEN: PRLTAO ISSN: 0031-9007
SICI: 0031-9007(19990215)82:7L.1470:TSMD;1-J
Material Identity Number: P096-1999-009
U.S. Copyright Clearance Center Code: 0031-9007/99/82(7)/1470(4)$15.00
Language: English
Abstract: Thermal treatment is reported to convert finely dispersed diamond powder to **multiwall** carbon nanocapsules containing fullerenes such as C/sub 60/. We investigate the internal dynamics of a related model system, consisting of a K@C/sub 60//sup +/ endohedral complex enclosed in a C/sub 480/ nanocapsule. We show this to be a tunable two-level system, where transitions between the two states can be induced by applying an electric field between the C/sub 480/ end caps, and discuss its potential application as a nonvolatile memory element.

Subfile: A C

43/3,AB/3 (Item 3 from file: 2)
DIALOG(R)File 2:INSPEC

6149298 INSPEC Abstract Number: A1999-05-8120V-003
Title: Self-assembly of carbon nanotubes
Author(s): **Tomanek, D.**
Author Affiliation: Dept. of Phys. & Astron., Michigan State Univ., East Lansing, MI, USA
Journal: Molecular Materials Conference Title: Mol. Mater. (Switzerland) vol.10, no.1-4 p.9-16
Publisher: Gordon & Breach,
Publication Date: 1998 Country of Publication: Switzerland
CODEN: MOMAEO ISSN: 1058-7276
SICI: 1058-7276(1998)10:1/4L.9:SACN;1-X
Material Identity Number: D322-1998-005
Conference Title: Fullerenes and Atomic Clusters. International Workshop. IWFAC'97
Conference Date: 30 June-4 July 1998 Conference Location: St. Petersburg, Russia
Language: English
Abstract: Carbon **nanotubes** , consisting of graphitic cylinders, have been synthesized in bulk quantities. This contribution summarizes our present knowledge of the microscopic mechanisms leading to the self-assembly of single-wall or **multi - wall** tubes. Numerical calculations, supported by experimental evidence, suggest these close relatives of fullerenes to be extremely stable with respect to mechanical stresses or applied electric fields.
Subfile: A

43/3,AB/4 (Item 4 from file: 2)
DIALOG(R)File 2:INSPEC

6126171 INSPEC Abstract Number: A1999-03-6148-009
Title: Electronic and structural properties of multiwall **carbon** nanotubes
Author(s): Young-Kyun Kwon; **Tomanek, D.**
Author Affiliation: Dept. of Phys. & Astron., Michigan State Univ., East Lansing, MI, USA
Journal: Physical Review B (Condensed Matter) vol.58, no.24 p. R16001-4
Publisher: APS through AIP,
Publication Date: 15 Dec. 1998 Country of Publication: USA
CODEN: PRBMDO ISSN: 0163-1829
SICI: 0163-1829(19981215)58:24L.r16001:ESPM;1-W
Material Identity Number: P279-1998-049
U.S. Copyright Clearance Center Code: 0163-1829/98/58(24)/16001(4)/$15.00
Language: English
Abstract: We calculate the potential energy surface, the low-frequency vibrational modes, and the electronic structure of a (5,5)@(10,10) double-wall carbon **nanotube** . We find that the weak interwall interaction and changing symmetry cause four pseudogaps to open and close periodically near the Fermi level during the soft librational motion at nu <or approximately=30 cm/sup -1/. This electron-libration coupling, absent in solids composed of fullerenes and single-wall **nanotubes** , may yield superconductivity in **multiwall nanotubes** .

Subfile: A

43/3,AB/5 (Item 5 from file: 2)
DIALOG(R)File 2:INSPEC

6028388 INSPEC Abstract Number: A9821-6146-002
Title: X-ray spectroscopic and quantum-chemical study of carbon tubes produced in arc-discharge
Author(s): Okotrub, A.V.; Bulusheva, L.G.; **Tomanek, D.**
Author Affiliation: Inst. of Inorg. Chem., Acad. of Sci., Novosibirsk, Russia
Journal: Chemical Physics Letters vol.289, no.3-4 p.341-9
Publisher: Elsevier,
Publication Date: 12 June 1998 Country of Publication: Netherlands
CODEN: CHPLBC ISSN: 0009-2614
SICI: 0009-2614(19980612)289:3/4L.341:SQCS;1-W
Material Identity Number: C027-98027
U.S. Copyright Clearance Center Code: 0009-2614/98/$19.00
Language: English
Abstract: High-resolution CK alpha spectra have been obtained for samples containing carbon cage particles, synthesized using the arc-discharge graphite evaporation technique. The X-ray fluorescence spectrum of particles from the inner part of the cathode deposit was found to differ from that of the soot collected on the chamber walls. The dependence of the spectral profile on the geometry was investigated using quantum-chemical calculations of carbon **nanotube** fragments with different helical pitches. The spectrum of **multiwall** particles agrees best with the theoretical spectra of zig-zag tubes. The agreement between the spectra of tubular particles in the soot and the theoretical results is best for single-wall armchair tube structures. These studies are complemented by calculations of the frontier orbitals of **nanotube** fragments.
Subfile: A

43/3,AB/6 (Item 6 from file: 2)
DIALOG(R)File 2:INSPEC

5714271 INSPEC Abstract Number: A9722-6146-007
Title: Morphology and stability of growing multiwall **carbon** nanotubes
Author(s): Young-Kyun Kwon; Young Hee Lee; Seong-Gon Kim; Jund, P.; **Tomanek, D.** ; Smalley, R.E.
Author Affiliation: Dept. of Phys. & Astron., Michigan State Univ., East Lansing, MI, USA
Journal: Physical Review Letters vol.79, no.11 p.2065-8
Publisher: APS,
Publication Date: 15 Sept. 1997 Country of Publication: USA
CODEN: PRLTAO ISSN: 0031-9007
SICI: 0031-9007(19970915)79:11L.2065:MSGM;1-4
Material Identity Number: P096-97039
U.S. Copyright Clearance Center Code: 0031-9007/97/79(11)/2065(4)$10.00
Language: English
Abstract: We use ab initio and parametrized calculations to investigate the morphology and structural stability at the growing edge of **multiwall** carbon **nanotubes** . We find that these open-ended structures are stabilized against dome closure by strong covalent bonds connecting the exposed edges of adjacent walls. Growth at the open edge involves rearrangement of these bonds, which are mediated by carbon atoms bridging the gap and change the tip morphology significantly. Presence of a strong

"lip-lip" interaction can explain formation of carbon **nanotubes** under annealing conditions.
Subfile: A

43/3,AB/7 (Item 7 from file: 2)
DIALOG(R)File 2:INSPEC

5635536 INSPEC Abstract Number: A9716-7120-007
Title: Electronic structure of single-wall, multiwall **, and filled carbon** nanotubes
Author(s): Ostling, D.; **Tomanek, D.** ; Rosen, A.
Author Affiliation: Dept. of Phys., Chalmers Univ. of Technol., Goteborg, Sweden
Journal: Physical Review B (Condensed Matter) vol.55, no.20 p. 13980-8
Publisher: APS through AIP,
Publication Date: 15 May 1997 Country of Publication: USA
CODEN: PRBMDO ISSN: 0163-1829
SICI: 0163-1829(19970515)55:20L.13980:ESSW;1-8
Material Identity Number: P279-97026
U.S. Copyright Clearance Center Code: 0163-1829/97/55(20)/13980(9)/$10
Language: English
Abstract: We determine the electronic structure of single-wall, **multiwall** , and filled carbon **nanotubes** using the local-density-functional formalism. In order to handle these extremely inhomogeneous systems of nested graphene cylinders with 10/sup 3/-10/sup 4/ valence electrons, we adopt a technique that discretizes the eigenvalue problem on a grid and yields simultaneously all occupied and unoccupied states. We apply this formalism to **nanotubes** , where the ionic background can be described by infinitely thin structureless cylindrical walls, and the electron distribution is subsequently obtained in a self-consistent manner. Comparison with parametrized calculations, which consider explicitly the atomic positions, proves that the essential features of the electronic structure in these systems do not depend on the exact atomic positions.
Subfile: A

43/3,AB/8 (Item 1 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

04221326
E.I. No: EIP95072792696
Title: Self-assembly of tubular fullerenes
Author: Guo, T.; Nikolaev, P.; Rinzler, A.G.; **Tomanek, D.** ; Colbert, D.T.; Smalley, R.E.
Corporate Source: Rice Univ, Houston, TX, USA
Source: Journal of Physical Chemistry v 99 n 27 Jul 6 1995. p 10694-10697
Publication Year: 1995
CODEN: JPCHAX ISSN: 0022-3654
Language: English
Abstract: Carbon **nanotubes** in the form of **multiwalled** fullerenes are shown here to self-assemble under homogeneous gas-phase conditions of carbon condensation in an inert atmosphere heated to 1200 degree C-conditions previously thought to be optimal only for the annealing and growth of C//6//0 and other spheroidal shells. Tubular fullerenes are known to be less stable than their spheroidal counterparts and have thus far been reported only in circumstances where some extrinsic factor (e.g., high

electric fields, catalytic metal particles, hydrogen atoms, or a surface at low temperature) was available to help keep the fullerene structure open at its growing end. The experimental evidence reported here now indicates that **multiwalled** tube growth is inherent in the condensation of pure carbon vapors. Adatoms bonded between edge atoms of adjacent layers at the growing end are proposed to be the crucial intrinsic factor facilitating tube growth by stabilizing the open conformation against closure. This new view of the growing **nanotube** tip structure is likely to impact on **nanotube** growth mechanisms under other conditions, particularly the arc. (Author abstract) 32 Refs.

43/3,AB/9 (Item 1 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

07329402 Genuine Article#: 151BE Number of References: 26
Title: Electronic and structural properties of multiwall **carbon** nanotubes (ABSTRACT AVAILABLE)
Author(s): Kwon YK (REPRINT) ; **Tomanek D**
Corporate Source: MICHIGAN STATE UNIV,DEPT PHYS & ASTRON/E LANSING//MI/48824 (REPRINT); MICHIGAN STATE UNIV,CTR FUNDAMENTAL MAT RES/E LANSING//MI/48824
Journal: PHYSICAL REVIEW B-CONDENSED MATTER, 1998, V58, N24 (DEC 15), P 16001-16004
ISSN: 0163-1829 Publication date: 19981215
Publisher: AMERICAN PHYSICAL SOC, ONE PHYSICS ELLIPSE, COLLEGE PK, MD 20740-3844
Language: English Document Type: ARTICLE
Abstract: We calculate the potential energy surface, the low-frequency vibrational modes, and the electronic structure of a (5,5)@(10,10) double-wall carbon **nanotube** . We find that the weak interwall interaction and changing symmetry cause four pseudogaps to open and close periodically near the Fermi level during the soft librational motion at nu less than or equal to 30 cm(-1). This electron-libration coupling, absent in solids composed of fullerenes and single-wall **nanotubes** , may yield superconductivity in **multiwall** **nanotubes** . [S0163-1829(98)51548-2].

43/3,AB/10 (Item 2 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

06701919 Genuine Article#: ZL813 Number of References: 42
Title: Electronic structure of carbon nanotubes (ABSTRACT AVAILABLE)
Author(s): Bulusheva LG (REPRINT) ; Okotrub AV; Romanov DA; **Tomanek D**
Corporate Source: SB RAS,INST INORGAN CHEM/NOVOSIBIRSK//RUSSIA/ (REPRINT); SB RAS,INST SEMICOND PHYS/NOVOSIBIRSK//RUSSIA/; MICHIGAN STATE UNIV,DEPT PHYS & ASTRON/E LANSING//MI/48824
Journal: PHYSICS OF LOW-DIMENSIONAL STRUCTURES, 1998, V3-4, P107-133
ISSN: 0204-3467 Publication date: 19980000
Publisher: V S V CO. LTD, BOX 11, 105523 MOSCOW, RUSSIA
Language: English Document Type: ARTICLE
Abstract: A study of the electronic structure of carbon nanoparticles has been carried out using the methods of quantum chemistry and X-ray emission spectroscopy. Fragments of (n, 0) tubes with n = 6,...,11 and of (5,5) -(10,0) tubes were calculated using PM3 method. The dependence of the electronic structure of the fragment on length and symmetry was investigated. The structure of the frontier orbitals was shown to change regularly depending on the tube chirality. Band structure of (n, 0) and (5,5) tubes was studied by the tight-binding method. A comparison of the basic blocks of the molecular orbitals (MOs) of the

fragment and bands of (6,0) and (5,5) tubes was carried out. Experimental CK alpha spectra for single-wall and **multiwall** carbon nanotubules were obtained. These spectra agree satisfactorily with the theoretical spectra plotted as the results of cluster calculations. The structure of the valence zone for the central hexagons of the **nanotube** fragments keeps the basic features in the series of tubes of various chirality. At the same time a considerable change of the electronic state of the boundary carbon atoms is observed.

43/3,AB/11 (Item 1 from file: 144)
DIALOG(R)File 144:Pascal

13394133 PASCAL No.: 97-0579528
Morphology and Stability of Growing Multiwall **Carbon** Nanotubes
KWON Young-Kyun ; LEE Young Hee; KIM Seong-Gon; JUND Philippe; **TOMANEK David** ; SMALLEY Richard E
Department of Physics and Astronomy, Michigan State University, East Lansing, Michigan 48824-1116; Department of Physics and Semiconductor Physics Research Center, Jeonbuk National University, Jeonju 561-756, Korea ; Center for Nanoscale Science and Technology, and Departments of Chemistry and Physics, Rice University, P.O. Box 1892, Houston, Texas 77251
Journal: Physical review letters, 1997-09-15, 79 (11) 2065-2068
Language: English
We use ab initio and parametrized calculations to investigate the morphology and structural stability at the growing edge of **multiwall** carbon **nanotubes** . We find that these open-ended structures are stabilized against dome closure by strong covalent bonds connecting the exposed edges of adjacent walls. Growth at the open edge involves rearrangement of these bonds, which are mediated by carbon atoms bridging the gap and change the tip morphology significantly. Presence of a strong lip-lip interaction can explain formation of carbon **nanotubes** under annealing conditions.

44/3,AB/1 (Item 1 from file: 2)
DIALOG(R)File 2:INSPEC

7158734 INSPEC Abstract Number: A2002-05-7125X-009
Title: Electronic interwall interactions and charge redistribution in multiwall nanotubes
Author(s): Miyamoto, Y.; Saito, S.; **Tomanek, D.**
Author Affiliation: Fundamental Res. Labs., NEC Corp., Tsukuba, Japan
Journal: Physical Review B (Condensed Matter and Materials Physics) vol.65, no.4 p.041402/1-4
Publisher: APS through AIP,
Publication Date: 15 Jan. 2002 Country of Publication: USA
CODEN: PRBMDO ISSN: 0163-1829
SICI: 0163-1829(20020115)65:4L.1:EIIC;1-L
Material Identity Number: J673-2002-003
U.S. Copyright Clearance Center Code: 0163-1829/2002/65(4)/041402(4)/$20.00
Language: English
Abstract: Using density functional theory, we calculate the charge redistribution incurred upon forming **multiwall** carbon **nanotubes** , or by sandwiching initially isolated single-wall **nanotubes** between graphene layers. In these systems, we observe a significant charge transfer between the pi electron system of the tube walls and a newly formed interlayer state. We discuss the direction of charge flow in terms of the interlayer hybridization and work function differences in the composite systems.
Subfile: A

44/3,AB/2 (Item 2 from file: 2)
DIALOG(R)File 2:INSPEC

7155225 INSPEC Abstract Number: A2002-05-7220F-001, B2002-02-0587-009
Title: Electrical and thermal transport in carbon nanotubes
Author(s): **Tomanek, D.**
Author Affiliation: Dept. of Phys. & Astron., Michigan State Univ., East Lansing, MI, USA
Journal: AIP Conference Proceedings Conference Title: AIP Conf. Proc. (USA) no.544 p.338-43
Publisher: AIP,
Publication Date: 2000 Country of Publication: USA
CODEN: APCPCS ISSN: 0094-243X
SICI: 0094-243X(2000)544L.338:ETTC;1-F
Material Identity Number: A210-2000-086
U.S. Copyright Clearance Center Code: 0094-243X/2000/$17.00
Conference Title: Electronic Properties of Novel Materials - Molecular Nanostructures. 14th International Winterschool/Euroconference
Conference Date: 4-11 March 2000 Conference Location: Kirchberg, Austria
Language: English
Abstract: Owing to their atomic level perfection, carbon **nanotubes** exhibit unusually high electrical and thermal conductivity. Our electrical transport calculations performed using a scattering technique based on the Landauer-Buttiker formalism, suggest that the conductance of inhomogeneous **multiwall nanotubes** may show an unusual fractional quantization behavior, in agreement with recent experimental data. Our calculations also indicate that due to the combination of a large phonon mean free path, speed of sound and specific heat, the thermal conductivity of an isolated (10,10) carbon **nanotube** exceeds that of any known material, reaching the value lambda approximately=6,600 W /m.K at room temperature.
Subfile: A B

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44/3,AB/3 (Item 3 from file: 2)
DIALOG(R)File 2:INSPEC

7129928 INSPEC Abstract Number: A2002-03-6148-017
Title: Imaging the interlayer interactions of multiwall **carbon** nanotubes **using scanning tunneling microscopy and spectroscopy**
Author(s): Hassanien, A.; Mrzel, A.; Tokumoto, M.; **Tomanek, D.**
Author Affiliation: Nanotechnology Res. Inst., Nat. Inst. of Adv. Ind. Sci. & Technol., Ibaraki, Japan
Journal: Applied Physics Letters vol.79, no.25 p.4210-12
Publisher: AIP,
Publication Date: 17 Dec. 2001 Country of Publication: USA
CODEN: APPLAB ISSN: 0003-6951
SICI: 0003-6951(20011217)79:25L.4210:IIIM;1-0
Material Identity Number: A135-2001-051
U.S. Copyright Clearance Center Code: 0003-6951/2001/79(25)/4210(3)/$18.0
0
Language: English
Abstract: Using atomically-resolved scanning tunneling microscopy and spectroscopy, we probe the nature of interwall interactions within **multiwall** carbon **nanotubes** at room temperature. We find that, at low bias voltages, the tunnel current depends strongly on the atomic position, introducing visibility differences between adjacent lattice sites. Since all atoms are equally visible in analogous measurements on single-wall **nanotubes** , we conclude that these modulations are introduced by the interwall interactions and provide unique information about the stacking nature.
Subfile: A
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44/3,AB/4 (Item 4 from file: 2)
DIALOG(R)File 2:INSPEC

6676130 INSPEC Abstract Number: A2000-18-7360T-002
Title: Fractional quantum conductance in carbon nanotubes
Author(s): Sanvito, S.; Kwon, Y.-K.; **Tomanek, D.** ; Lambert, C.J.
Author Affiliation: Sch. of Phys. & Chem., Lancaster Univ., UK
Journal: Physical Review Letters vol.84, no.9 p.1974-7
Publisher: APS,
Publication Date: 28 Feb. 2000 Country of Publication: USA
CODEN: PRLTAO ISSN: 0031-9007
SICI: 0031-9007(20000228)84:9L.1974:FQCC;1-H
Material Identity Number: P096-2000-014
U.S. Copyright Clearance Center Code: 0031-9007/2000/84(9)/1974(4)$15.00
Language: English
Abstract: Using a scattering technique based on a parametrized linear combination of atomic orbitals Hamiltonian, we calculate the ballistic quantum conductance of **multiwall** carbon **nanotubes** . We find that interwall interactions not only block some of the quantum conductance channels, but also redistribute the current nonuniformly over individual tubes across the structure. Our results provide a natural explanation for the unexpected integer and noninteger conductance values reported for **multiwall** **nanotubes** by Stefan Frank et al. [Stefan Frank et al., Science 280, 1744 (1998)].
Subfile: A
Copyright 2000, IEE

44/3,AB/5 (Item 1 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

10373386 Genuine Article#: 518BP Number of References: 27
Title: Electronic interwall interactions and charge redistribution in multiwall nanotubes **- art. no. 041402** (ABSTRACT AVAILABLE)
Author(s): Miyamoto Y (REPRINT) ; Saito S; **Tomanek D**
Corporate Source: NEC Corp Ltd,Fundamental Res Labs,34 Miyukigaoka/Tsukuba/Ibaraki 3058501/Japan/ (REPRINT); NEC Corp Ltd,Fundamental Res Labs,Tsukuba/Ibaraki 3058501/Japan/; Tokyo Inst Technol,Dept Phys, Meguro Ku,Tokyo 1528551//Japan/; Michigan State Univ,Dept Phys & Astron,E Lansing//MI/48824
Journal: PHYSICAL REVIEW B, 2002, V6504, N4 (JAN 15), P1402-+
ISSN: 0163-1829 Publication date: 20020115
Publisher: AMERICAN PHYSICAL SOC, ONE PHYSICS ELLIPSE, COLLEGE PK, MD 20740-3844 USA
Language: English Document Type: ARTICLE
Abstract: Using density functional theory, we calculate the charge redistribution incurred upon forming **multiwall** carbon **nanotubes** , or by sandwiching initially isolated single-wall **nanotubes** between graphene layers, In these systems, we observe a significant charge transfer between the pi electron system of the tube walls and a newly formed interlayer state. We discuss the direction of charge flow in terms of the interlayer hybridization and work function differences in the composite systems.

44/3,AB/6 (Item 1 from file: 65)
DIALOG(R)File 65:Inside Conferences

04025019 INSIDE CONFERENCE ITEM ID: CN042300536
Scanning Tunneling Microscopy and Spectroscopy of Short Multiwall **Carbon** Nanotubes
Hassanien, A.; Mrzel, A.; Tokumoto, M.; Zhao, X.; Ando, Y.; **Tomanek, D.**
CONFERENCE: Nanotubes and related materials-Symposium A
MATERIALS RESEARCH SOCIETY SYMPOSIUM PROCEEDINGS, 2001; VOL 633 P: A14.28
Warrendale, Pa., Materials Researc Society, 2001
ISBN: 1558995439
LANGUAGE: English DOCUMENT TYPE: Conference Selected papers
CONFERENCE EDITOR(S): Rao, A. M.
CONFERENCE SPONSOR: Materials Research Society
CONFERENCE LOCATION: Boston, MA 2000; Nov (200011) (200011)
NOTE:
Held during the MRS fall meeting

44/3,AB/7 (Item 2 from file: 65)
DIALOG(R)File 65:Inside Conferences

03323841 INSIDE CONFERENCE ITEM ID: CN035133495
Quantum Transport in Inhomogeneous Multi - Wall Nanotubes
Sanvito, S.; Kwon, Y.-K.; **Tomanek, D.** ; Lambert, C. J.
CONFERENCE: Nanotube '99; Science and application of nanotubes-Conference; edited by D. Tomanek and R. J. Enbody
P: 333-348
New York, London, Kluwer Academic/Plenum, 2000
ISBN: 0306463725
LANGUAGE: English DOCUMENT TYPE: Conference Papers

CONFERENCE EDITOR(S): **Tomanek, D. ; Enbody, R. J.**
CONFERENCE LOCATION: East Lansing, MI
CONFERENCE DATE: Jul 1999 (199907) (199907)
NOTE:
Includes bibliographical references and index

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File   9:Business & Industry(R) Jul/1994-2002/May 01
         (c) 2002 Resp. DB Svcs.
File  15:ABI/Inform(R) 1971-2002/May 04
         (c) 2002 ProQuest Info&Learning
File  16:Gale Group PROMT(R) 1990-2002/May 03
         (c) 2002 The Gale Group
File 160:Gale Group PROMT(R) 1972-1989
         (c) 1999 The Gale Group
File  18:Gale Group F&S Index(R) 1988-2002/May 03
         (c) 2002 The Gale Group
File  20:Dialog Global Reporter 1997-2002/May 06
         (c) 2002 The Dialog Corp.
File 148:Gale Group Trade & Industry DB 1976-2002/May 03
         (c)2002 The Gale Group
File 481:DELPHES Eur Bus 95-2002/Apr W4
         (c) 2002 ACFCI & Chambre CommInd Paris
File 570:Gale Group MARS(R) 1984-2002/May 03
         (c) 2002 The Gale Group
File 583:Gale Group Globalbase(TM) 1986-2002/May 03
         (c) 2002 The Gale Group
File 621:Gale Group New Prod.Annou.(R) 1985-2002/May 02
         (c) 2002 The Gale Group
File 624:McGraw-Hill Publications 1985-2002/May 03
         (c) 2002 McGraw-Hill Co. Inc
File 635:Business Dateline(R) 1985-2002/May 04
         (c) 2002 ProQuest Info&Learning

Set     Items   Description
S1       1707   NANOTUBE?
S2       4202   MULTI()WALL? ? OR MULTIWALL? OR MULTI-WALL? ?
S3          3   MICROFASTEN? OR MICRO()FASTEN? OR MICRO-FASTEN?
S4      64207   FASTEN?
S5       5706   HOOK? ? AND LOOP? ?
S6       8398   VELCRO?
S7     111694   SPIRAL?
S8     236719   DEFORM? OR BEND OR BENDS OR BENDAB? OR BENDING OR BENT
S9      16642   NON()LINEAR OR NON-LINEAR
S10   1631064   METALS OR CARBON OR SILICON OR GERMANIUM OR POLYMERS
S11        66   REUSAB?(3N)FASTENER?
S12     17447   MATING
S13      1013   MICROTUB? OR MICRO()(TUBE? OR TUBULAR)
S14         0   NANOVELCRO? OR NANO-VELCRO? OR NANO()VELCRO?
S15         3   NANOSCALE AND (FASTENING OR FASTENER?)
S16         2   RD (unique items)
S17         0   S1 AND S3
S18         4   S1 AND S4
S19         4   RD (unique items)
S20         4   S19 NOT S16
S21        59   S1 AND S2
S22         2   S21 AND (S5 OR S6)
S23         2   RD (unique items)
S24         1   S23 NOT (S16 OR S19)
S25        30   S21/TI,LP
S26        28   S25 AND (S7 OR S8 OR S9 OR S10 OR S11 OR S12)
S27        19   RD (unique items)
S28        19   S27 NOT (S16 OR S19 OR S23)
S29         4   S1 AND (S5 OR S6)
S30         4   RD (unique items)
S31         1   S30 NOT (S16 OR S19 OR S23 OR S27)
S32         1   S13 AND S3
S33         1   S32 NOT (S16 OR S19 OR S23 OR S27 OR S30)
S34         0   S1 AND S12 AND S4
S35         0   S1(S)S12
```

S36	1	S12(S)S13
S37	1	S36 NOT (S16 OR S19 OR S23 OR S27 OR S30 OR S32)
S38	0	S1 AND S11
S39	104	S1 AND S8 AND S10
S40	43	S39/TI,LP
S41	34	RD (unique items)
S42	5	S41 AND S2
S43	1	S42 NOT (S16 OR S19 OR S23 OR S27 OR S30 OR S32 OR S36)
S44	6	S1 AND S9
S45	6	RD (unique items)
S46	4	S45 NOT (S16 OR S19 OR S23 OR S27 OR S30 OR S32 OR S36 OR - S42)

16/3,K/1 (Item 1 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

09083976 Supplier Number: 79197011 (USE FORMAT 7 FOR FULLTEXT)
39th Annual R&D 100 Awards.(Cover Story)(Industry Overview)
R & D, v43, n9, p29
Sept, 2001
Language: English Record Type: Fulltext
Article Type: Cover Story; Industry Overview
Document Type: Magazine/Journal; Refereed; Trade
Word Count: 23697

... both strength and ductility changes. However, as the scale of the microstructure decreases into the **nanoscale** region, conventional relationships and paradigms break down and become invalid. This fundamental limitation can be...

...Laboratory, Idaho Falls. By producing this material with either a metallic glass (angstrom scale) or **nanoscale** composite microstructure, the mechanisms controlling strength and ductility can be separated into two distinct physical...fact that photons from a Raman excitation laser can couple to free conducting electrons in **nanoscale** gold or silver particles, generating a surface plasmon field that provides an efficient pathway to...form.

This adiabatic metal forming process can be applied to the automotive, flow control, aviation, **fastener** , and hardware and tooling industries.

www.lmcpress.com

Write In 2040

Aluminum Furnace Reduces Harmful...

16/3,K/2 (Item 1 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

11111230 SUPPLIER NUMBER: 54829236 (USE FORMAT 7 OR 9 FOR FULL TEXT)
A triumph of lateral thought.(auxetic materials)
Alderson, Andrew
Chemistry and Industry, 10, 384(6)
May 17, 1999
ISSN: 0009-3068 LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 5138 LINE COUNT: 00425

... absorbing sound and vibration. Lakes has also used copper foam as an auxetic press-fit **fastener** . The **fastener** is easy to insert because it contracts radially in response to the applied pressure, and...as carbon nitride is a leading candidate in the search for materials harder than diamond.

Nanoscale macrocyclic hydrocarbons similar to the conventional molecular honeycomb network sub-units proposed by Evans have...

20/3,K/1 **(Item 1 from file: 16)**
DIALOG(R)File 16:Gale Group PROMT(R)

08588716 Supplier Number: 64520216 (USE FORMAT 7 FOR FULLTEXT)
BUYERS' GUIDE ADDRESS INDEX.
Ceramic Industry, v150, n8, p27
July 15, 2000
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 45712

... 971-1180
advertising@flexco.com
www.flexco.com
Richard B. Reynolds
Manufacturer of conveyor belt **fasteners** , belt cleats and conveyor belt maintenance products.
FLOW AUTOCLAVE SYSTEMS INC.
3721 Corporate Dr., Columbus...NJ 07644 U.S.A.
(201) 471-7770 Fax: (201) 471-9666
www.hkmetalcraft.com
Fasteners , stamping, washers, gaskets.
HLC INTERNATIONAL, HOLAMPCO INTERNATIONAL
5825 Ellsworth Ave., Pittsburgh, PA 15232 U.S...Owner Women-owned manufacturer and distributor of high purity metal, ceramic and composite nanoparticles, nanocrystals, **nanotubes** , fullernes, nanophase, and nanoballs.
NANSHU GRAPHITE CORP.
301 Bridge Plaza N., Fort Lee, NJ 07024...

20/3,K/2 **(Item 1 from file: 20)**
DIALOG(R)File 20:Dialog Global Reporter

17959986 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Houston Chronicle Jim Barlow Column
Jim Barlow
KRTBN KNIGHT-RIDDER TRIBUNE BUSINESS NEWS (HOUSTON CHRONICLE - TEXAS)
July 24, 2001
JOURNAL CODE: KHCN LANGUAGE: English RECORD TYPE: FULLTEXT
WORD COUNT: 688

(USE FORMAT 7 OR 9 FOR FULLTEXT)

... seen by the human eye. It would float through the human body, get inside or **fasten** to a cancerous cell and destroy it. Or, the microscopic workhorses could bind with HIV...

... Technology at Rice. He's also the founder of Carbon Nanotechnologies of Houston, which produces **nanotubes** , made of a single carbon atom -- about 8,000 times thinner than a human hair.

These **nanotubes** have all sorts of uses. First, they are extremely strong -- 60 times greater than steel...

...slow down or speed up electrical flow.

Carbon Nanotechnologies isn't the only company making **nanotubes** . There's Mitusbishi Manufacturing of Japan in partnership with Materials and Electrochemcial Research and Research Technologies -- both of Tucson, Ariz., and Showa Denaka Co. of Japan.

The products of the **nanotube** companies won't be appearing soon on a store shelf near you. The present output...

...a fortune.
Smalley is using the money to build a plant to raise production of **nanotubes** from 25 grams to 2.5 kilograms a day.
The new process will drive down the price of **nanotubes** from $220,000 a pound to $200 a pound. At that price, Smalley told Red...

...profit.
Even at $200 a pound, you're not going to see the super-strong **nanotubes** replace steel in cars or even lighter or more expensive metals in airplanes. But given...

20/3,K/3 (Item 2 from file: 20)
DIALOG(R)File 20:Dialog Global Reporter

12130138 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Stranger than fiction: Within 40 years, self-transforming robots could be scaling space, writes Sanjida O'Connell
SANJIDA O'CONNELL
GUARDIAN
July 27, 2000
JOURNAL CODE: FGDN LANGUAGE: English RECORD TYPE: FULLTEXT
WORD COUNT: 1104

(USE FORMAT 7 OR 9 FOR FULLTEXT)

... a pair of limbs as arms, they could attach their arms in a different position, **fasten** on another set and scale a cliff like a spider.
Finally, groups of robots would...

...bathing in acid."
He imagines a bone structure clothed in a skin grown from carbon **nanotubes** . So will the eels and seahorses spot life on Europa? "Frankly I would love it...
... say hi, and rather more partial to taking a bite out of home-grown carbon **nanotubes** shaped like seahorses. In any case, what we do know is that within 40 years...

20/3,K/4 (Item 1 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

10152769 SUPPLIER NUMBER: 20518926 (USE FORMAT 7 OR 9 FOR FULL TEXT)
ANTEC '98 seminars: April 27-May 1, 1998. (seminars at the Society of Plastics Engineer's Annual Technical Conference)
Plastics Engineering, v54, n3, p31(56)
March, 1998
ISSN: 0091-9578 LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 54261 LINE COUNT: 04910

... devices to lower costs
* Disassembly considerations
Chemical Assembly Methods
* Adhesive sealing
* Hot Melts
* Solvent sealing
Fasteners and Inserts
* Self-tapping screws
* Inserts

* Studs
* Specialty **fasteners**

Insert and Multi-Material Molding
* Molded-in inserts
* Molding parts together

Material and Part Reduction
* Combining parts
* Thinwalling
* **Fastener** reduction

Mechanical Assembly Methods
* Press fits/force fits/interference fits/shrink fits
* Cantilever, cylindrical and...a fundamental difference in designing a part to be assembled with snap-fits versus threaded **fasteners** . Unfortunately, most designers are not exploiting the advantages of using snap-fits to the maximum ASME Joining and **Fastening** subcommittee, and a member of the SPE Decorating and Assembly Division.

Dr. Luscher received his...

...later, as a project manager in the Design and Manufacturing Institute. Tony founded the Integral **Fastening** Program at RPI in 1992.

Gaurav Suri

Gaurav Suri is a researcher in the Department...and improve paint transfer efficiency and first pass yield. The conductivity is provided via graphite **nanotubes** .

#110 (10:00AM)

The Effect of Molecular Weight on Properties of Ternary Acrylic-based Polycarbonate...

24/3,K/1 **(Item 1 from file: 16)**
DIALOG(R)File 16:Gale Group PROMT(R)

08197276 Supplier Number: 68864079 (USE FORMAT 7 FOR FULLTEXT)
supplier listings.
Paint & Coatings Industry, v16, n12, p114
Dec, 2000
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 19167

... Pres.
High solids, oil-free polyester resins.
Company Type: S

Everlight USA Inc.

10507 Southern **Loop** Blvd.
Pineville, NC 28134
(704) 588-1004 Fax: (704) 588-0051
everlight@everlightusa.com
www...com
www.fibcrecycling.com
Martha Cavazos
Cleaning and reconditioning of FIBCs
(bulk bags) in closed- **loop** system.
Company Type: P

Filter Specialists, Inc. (FSI)

100 Anchor Rd., P.O. Box 735...Delaware, OH 43015
(740) 549-6000 Fax: (740) 549-6100
Containers, steel, fibre, plastic
drums; **multiwall** bags, corrugated
containers, industrial hazardous
waste packaging; salvage over
packs; secondary containment;
flame-a-way...Mktg.; David Humphrey, V.P.-Mktg./Sales
Manufacturing 55-gallon poly and
steel drums, closed **loop** packaging,
including trip leasing and container
management, using IBC's and drums.
Company Type: P...Charles Reade, Sales Mgr.;
Emily Reade, Owner
Manufacturer of nano-sized (ultra-fine,
nanoparticle, nanocrystal, **nanotube**)
powders sized between 250
and 5 nanometers; technical info is
available at our website.
Company...43608-1591
(419) 729-5446 Fax: (419) 729-0241
Ken Obertacz, Plant Mgr.
Racks and **hooks** for paint and
powder coating.

TOR Minerals International,
formerly Hitox Corp.

722 Burleson St.
Corpus...

...Fax: (570) 823-4080

info@trionind.com
www.trionind.com
Walt Curnow, Dir.-Mktg.
Racks, **hook** (powder or liquid coating).
Company Type: P

Troy Corp.

8 Vreeland Rd., P.O. Box...

28/3,K/1 (Item 1 from file: 9)
DIALOG(R)File 9:Business & Industry(R)

03331239
Nanotube **Growth System**
(NanoDevices Inc introduces EasyTube NanoFurnace)
Semiconductor International, v 25, n 1, p 82
January 2002
DOCUMENT TYPE: Journal ISSN: 0163-3767 (United States)
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 82

Nanotube **Growth System**

TEXT:
...The EasyTube NanoFurnace gives researchers the ability to quickly and easily produce either single- or **multi - wall carbon nanotubes** . The instrument is fully programmable and can be operational on the day of installation. It utilizes **carbon** decomposition and catalyzed CVD to produce **nanotubes** directly on the surface of device substrates. First production units should begin shipping in the...

28/3,K/2 (Item 2 from file: 9)
DIALOG(R)File 9:Business & Industry(R)

03266194 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Researchers see big performance gain over back-gate field-effect transistors -- IBM demonstrates top-gate nanotube **FETs**
(IBM Corp has made a top-gate carbon nanotube **field-effect transistor)**
Electronic Engineering Times, p 59
October 15, 2001
DOCUMENT TYPE: Journal ISSN: 0192-1541 (United States)
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 817

(USE FORMAT 7 OR 9 FOR FULLTEXT)
Researchers see big performance gain over back-gate field-effect transistors -- IBM demonstrates top-gate nanotube **FETs**
(IBM Corp has made a top-gate carbon nanotube **field-effect transistor)**

TEXT:
By: Paul Kallender

Tsukuba, Japan - IBM Corp. has manufactured a top-gate **carbon nanotube** field-effect transistor, a key breakthrough for post- **silicon** circuit design, a leading researcher told the recent **Nanotube** Symposium here. Separately, another researcher challenged his colleagues to develop nanometer-scale magnets.

IBM's device places an independent gate just above a **carbon nanotube** that connects the source and drain, potentially yielding "more than one order of magnitude better performance" than back-gate **carbon nanotube** FETs, said Phaedon Avouris, manager of nanometer-scale science and technology at IBM.

...

IBM has already achieved results comparable to traditional **silicon** dioxide FETs with its recently developed p- and n-type **carbon** nanotube FETs, where the gate and nanotubes are separated by about 150 nanometers. IBM's...

...Yorktown Heights, N.Y., will now work to bring down the gap for top-gate **carbon** nanotube FETs to 2 nm, increasing the performance exponentially and fulfilling the promise of **carbon** nanotubes as a nanoscale replacement for **silicon** circuits.

"The game is to get to 2 nm, and we're going down. The devices we have now compare well with **silicon** dioxide, and that's at 150 nm. Wait until we get to 2 (nm)," Avouris...

...research lab said it had integrated molecular-scale logic circuits mixing p- and n-type **carbon** nanotube FETs along **carbon** nanotubes to form logic gate voltage inverters. Until that achievement, researchers had succeeded in developing arrays of only p-type **carbon** nanotube FETs. IBM researchers found that by annealing normal p-type **carbon** nanotube FETs in a vacuum, they could manufacture p-type, n-type and ambipolar **carbon** nanotube FETs to form complementary intermolecular logic gates.
In other words, they had created nanoscale...

...IBM's breakthroughs bolstered an upbeat conference that sought to map out the potential of **carbon** nanotube technology.

Reviewing the decade, Leo Esaki of the Science Academy of Tsukuba pointed to...

...including Atsushi Oshiyama predicted nanotubes could act as semiconductors. That year, 1992, the first multiwalled **carbon** nanotubes were made. Single-walled-tube manufacture followed in 1993. Basic electrical properties were figured...

...were first produced in 1998. Since then, researchers have found they can stuff nanotubes with **Carbon** 60 and other molecules to form complex structures.

Nanotube billionaires

Over the next decade, **carbon** nanotubes could produce a clutch of "billionaires" among those who develop key device breakthroughs, and...
...the 2010s, Esaki said. Japan is on the verge of developing a nanotechnology industry, with **carbon** nanotubes, or CNTs, as a key weapon.

After reviewing his discovery, Iijima said **carbon** nanohorns were the next frontier for developing nanobatteries with up to 10 times the capacitance ...

...lithium-ion batteries. Iijima stumbled across the horns in 1999 in a vapor trail of **carbon** shot with a **carbon** dioxide laser. Jutting from globules, the horns guzzle gasses and are easy to make at...

...Tsukuba, challenged researchers to confirm two new theories that could again help revolutionize electronics: that **carbon** nanotubes can be made into nanomagnets and that today's basic **carbon** nanotube "peapods"-devices with **carbon** 60 molecules-are one-dimensional **metals** that can be made into superconductor wires.

Researchers now understand that breaking off the tips of **carbon** nanotubes disturbs the electron spin balance that normally exists through the body of the tube...

...in a controllable way and then move to develop magnets, he said.
"If we manipulate **carbon** correctly, we can make **carbon** magnets," he said. "How soon can it be confirmed? Within a year or within a...

...of that, Steven Louie of the University of California at Berkeley said his studies of **carbon** -boron-nitrogen nanotubes and peapods confirmed that nanotubes could be made into quantum wires. Berkeley has made Schottky barriers by adding defects in **carbon** nanotubes, considerably altering their conductance. That property, he said, could lead to "on-tube" junction ...

28/3,K/3 (Item 1 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

02318462 109675211
The nanotube **computer**
Rotman, David
Technology Review v105n2 PP: 36-45 Mar 2002
ISSN: 1099-274X JRNL CODE: TCR
WORD COUNT: 3473

The nanotube **computer**

ABSTRACT: **Carbon** nanotubes are the ideal material for building tomorrow's nanoelectronics. More than 10 years after...

... in computer memory and logic that nanotubes could have their greatest impact. Microelectronics now use **silicon** transistors with features as small as 130 nanotubes across. However, it is getting harder to continue to shrink **silicon** devices. Using nanotubes or related materials as tiny electronic switches would allow computer designers to...
TEXT: TEN YEARS AFTER THEIR DISCOVERY, **CARBON** NANOTUBES ARE POISED TO LEAVE THE LAB AND ENTER THE REALM OF TECHNOLOGY. THAT COULD...

...COMPUTERS.

Nano hairs: A microscopic image shows a lone nanotube as it extends from a **silicon** tip. In a synthesis method developed by Harvard University's Charles Lieber, nanotubes grow out of tiny pores in the **silicon** .

In the hype-filled world of nanotechnology, Phaedon Avouris, head of IBM Research's nanoscience...

... several thick gold electrodes. What is not so apparent is that the thread, a single **carbon** nanotube, has been modified and positioned so that it forms two types of transistors, each...

... merely a crude laboratory demonstration, its successful fabrication is nevertheless a further tantalizing due that **carbon** nanotubes could one day replace **silicon** crystals as the building blocks for ultrafast, ultrasmall computers. More measurements are needed, says Avouris...

... in size, nanotube transistors show a performance superior to that of state-of-the-art **silicon** transistors.'

Indeed, **carbon** nanotubes are, in theory at least, the ideal material for building tomorrow's nanoelectronics. And...

... in computer memory and logic that nanotubes could have their greatest impact. Microelectronics now use **silicon** transistors with features as small as 130 nanometers across, which means that Intel can squeeze...

... 4 chip. However, it's getting harder-and far more expensive-to continue to shrink **silicon** devices. Using nanotubes or related materials called nanowires as tiny electronic switches would allow computer...

... a chip. If these molecular transistors work-and that is still a big if-replacing **silicon** will likely take years. But the ambition, says Charles Lieber, a Harvard University chemist, is to build electronics with performance "orders of magnitude beyond **silicon** . We're trying to break with what is being done, to really change things."

NANO GEMS

Carbon nanotubes are sometimes described as, basically, soot. In fact, they can be found among the deposits formed when electricity arcs between two **carbon** electrodes. But describing nanotubes as soot is like saying diamonds are nothing more than compressed coal. Each **carbon** atom in a nanotube is naturally positioned in a chicken-wire lattice that wraps into ...

... perfection gives nanotubes their long list of unusual-and potentially useful-properties.

Knowledge of the **carbon** structure dates back to 1985, when researchers at Rice University in Houston discovered soccerball-shaped **carbon** molecules called fullerenes. Following the discovery, theoretical physicists predicted that tubular versions of this same **carbon** structure could exist and that such molecules would have a number of enticing properties, such...

... Mildred Dresselhaus, a physicist at MIT, recalls calculating the likely properties of what she called **carbon** "nanotubules. "We didn't have them yet," she says, but it was still possible to...

...what they might be like."

Spurred by the growing excitement over the new form of **carbon** , Sumio Iijima, a physicist at NEC Research in Tsukuba, Japan, went hunting for **carbon** nanotubes in late 1990. Trained in electron microscopy, Iijima says he was used to "looking...

... after beginning his search, Iijima hit pay dirt. "When I saw all these needles of **carbon** , immediately I came to the right answer," he remembers.

What Iijima was peering at were "multiwall" nanotubes-- long **carbon** molecules stuffed one within another like nested Russian Matryoshka dolls. In 1993, Iijima and his...

... electrons. Nanotubes can do this at remarkably low voltages because of their extreme sharpness. So **carbon** nanotubes are almost perfect for building tiny, efficient electron emitters. They can direct focused electron...

...Step

Microscopic image of a logic gate that IBM researchers built out of a single **carbon** nanotube (blue line).The exposed and unexposed segments of the nanotube form two different types...
... from top left: Bundles of nanotubes; nanotubes aligned by electrical fields; multiwall tubes on a **silicon** substrate; nanotubes suspended from **silicon** pillars.

As many as two dozen electronics firms, including Samsung and Motorola, are now racing...

... But the real prize in nanoelectronics-the one that will make people truly forget about **silicon** -is the logic circuits that are the brains of computers. Moore's Law, the oft...

...experts predict that within a decade or so, it may well be impossible to make **silicon** transistors small enough to continue to uphold Moore's Law.

There is no shortage of technologies proposed to eventually replace **silicon** , from ways to use complex organic molecules as transistors to "quantum computing" (see "Beyond **Silicon** ," TR May/June 2000). But **carbon** nanotubes are emerging as a leading candidate. Not only are they the right size, with...

... that, over the next decade, it may be possible to gradually integrate them with conventional **silicon** technology. That could give nanotubes the inside track, since most chip makers are no more **carbon** nanotubes appeared in 1998. A little more than a nanometer in size, it was a...

...their special properties.

MATERIALS OF FAITH

One direct benefit of a decade of research on **carbon** nanotubes has been a growing understanding of nano materials in general-and an ever growing belief in their vast practical potential. " **Carbon** nanotubes have opened peoples' eyes to the possibilities," says Philip Collins, a researcher at Covalent...

... In particular, researchers are now pursuing ultrasmall wires and nanotubes composed of materials other than **carbon** , including some of the very same ones that many researchers had hoped to replace- **silicon** and other conventional semiconductors. These new nanowires are slightly larger than **carbon** nanotubes and are not as strong or conductive; but at least for now they are...

... beginning to investigate all different kinds of nanotubes and nanowires," he says.
A pioneer in **carbon** nanotubes, Lieber, for one, has over the last year published a string of scientific reports...

... gates. Last fall, for example, his research group at Harvard reported constructing logic circuits from **silicon** and gallium nitride nanowires. "With control of the electronic properties, we can start to build...

...intermolecular forces.

All that leaves many of those who have spent the last decade studying **carbon** nanotubes encouraged by the expanding possibilities. The technology winners and losers are still far from...

... the computer giant should go ahead with a significant effort to develop nanoelectronics based on **carbon** nanotubes. If the prognosis is promising, the project will be passed on to IBM's...

... least a decade before nanotubes become a significant part of computers. Challenging the supremacy of **silicon** is an enormous technical and financial task that will take far more than some promising...

... labs around the world. If the ambitions of these far-flung research groups pay off, **carbon** nanotubes and other nanowires will not only have altered how chemists and physicists perceive the...R. Stanley Williams, head of Hewlett-- Packard's quantum science research labs (see "Computing after **Silicon** ,"TR September/October 1999).The danger, says Williams, is that while there are"real gems...

28/3,K/4 (Item 2 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

02005007 51978393
Nanotubes **flaunt strength**
Sharke, Paul
Mechanical Engineering v122n4 PP: 12 Apr 2000
ISSN: 0025-6501 JRNL CODE: GMEE
WORD COUNT: 227

Nanotubes **flaunt strength**

ABSTRACT: Researchers at Washington University in St. Louis have been putting **carbon** nanotubes in a new tensile tester and coming up with some remarkably high strengths.
TEXT: Researchers at Washington University in St. Louis have been putting **carbon** nanotubes in a new tensile tester and coming up with some remarkably high strengths. In...

...any reported value for any type of material," Ruoff said.

Taking the lower density of **carbon** nanotubes into account, Ruoff pronounced the outer shell of the nanotubes about 80 times stronger...

28/3,K/5 (Item 1 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

09698621 Supplier Number: 84560104 (USE FORMAT 7 FOR FULLTEXT)
A status report on technology for carbon nanotube **devices. (Nanotechnology).**
Kreupl, Franz; Graham, Andrew; Honlein, Wolfgang
Solid State Technology, v45, n4, pS9(5)
April, 2002
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Refereed; Trade
Word Count: 3010

A status report on technology for carbon nanotube **devices. (Nanotechnology).**
... materials and integration methods must be found for sub-10nm feature sizes on semiconductor devices. **Carbon** nanotubes have been widely proclaimed as part of a solution because of their extraordinary electrical and mechanical properties. Recent developments in **carbon** nanotube technology hold promise for some preliminary fabrication methods to realize the first level of nanotube-based microelectronics.

Carbon nanotubes (CNTs) have been proposed as an alternative to conventional **silicon** -based microelectronics when the latter's feature sizes reach ~ 10nm (1-3). CNTs are made...
...with typical diameters of 1-20nm (Fig. 1). Because of graphite's unique bonding configuration, **carbon** atoms form a strong, flat hexagonal film with a layer of nearly free electrons above...

...diameter (4).
CNTs can be made with few structural defects. This, combined with the high **carbon** - **carbon** bond strength, leads to tubes that can withstand temperatures up to 2800(degrees) in vacuum...

...arc-discharge, or chemical vapor deposition (CVD) (1): The first two methods use a heated **carbon** target containing trace catalyst **metals** and a powerful laser or arc-discharge in a controlled atmosphere. Evaporated

carbon forms nanotubes in the gas-phase that collect on the reaction chamber walls or on the opposite electrode. CVD methods begin with supported catalyst particles that are exposed to a **carbon** feedstock gas. **Carbon** atoms from the dissociation of these molecules at the catalyst surface dissolve in the catalyst...

...substrate, catalyst type, and growth temperature. We have investigated many different substrate materials (e.g., **silicon** oxide and nitride, titanium, tantalum, tantalum nitride) that all support nanotube growth from a 5nm...
...nanotubes in Fig. 2 were grown from a 5nm-thick, iron-based film on a **silicon** oxide substrate. (Note that the nanotubes are ordered roughly perpendicular to the surface.)
Noble metal...

...as gold appear to suppress growth, probably by alloy formation with the catalyst material. Refractory **metals** and their nitrides have the additional advantage of acting as diffusion barriers separating the potentially...

...temperature growth conditions, CVD methods generate mostly multiwalled nanotubes. It is also possible to introduce **metals** and compounds into the hollow core of nanotubes to create nanowires (8). Because CNTs can...of nanotubes suggests low-voltage field emission devices for flat-panel displays (9).
In fact, **carbon** nanotube based field-emission displays (FEDs) are expected by 2003.
Nanotube conductors
The 2001 International...

...can be selectively grown at a desired location with prescribed properties, active devices similar to **silicon** -based microelectronics are possible. Indeed, a group at Delft University in The Netherlands has succeeded in modulating the conductivity of a semiconducting **carbon** nanotube by six orders of magnitude (16). The basic field-effect device was a nanotube deposited between metallic source and drain contacts on an oxide-covered **silicon** wafer (Fig. 4). The doped **silicon** substrate acted as the back-gate electrode in this CNT-FET device.
In their work...However, the development of a fabrication method that uses CNTs as building blocks instead of **silicon** transistors is still far away. Most of the applications cited here rely on arduous contacting...

...time-consuming micro-manipulations by atomic force microscopes. Parallel processing, which is the cornerstone of **silicon** technology has not yet been achieved.
CVD deposition of CNTs, exploiting the use of a...

...a controlled manner. In addition, other problems must be solved: for example, contacting CNTs with **metals** to yield reproducible low ohmic-contact resistances. The formation of undesirable, atomically thin oxide and...

...contact resistance and stability (20).
Interestingly, we can also envision bringing biological methods into play. **Carbon** -based molecules can be modified to a great extent and so can nanotubes. Work has...

...predefined location on a substrate or to glue certain tubes together and thus combine prefabricated **carbon** nanotube building blocks "in vitro."
DNA coding may also be used to facilitate intelligent self...

...envision a new technology not restricted to the two-dimensional surface of a single crystal **silicon** wafer. Instead, truly three-dimensional

arrangements with active devices as well as interconnects made out...

...be quickly overcome. We expect that CNT-based devices will compete very strongly with conventional **silicon** circuits on the nanometer scale.

References

(1.) P.G. Collins, Ph. Avouris, Scientific American, Dec...

...10.) W. Steinhogal, et al., Proc. of the Third European Workshop on Ultimate Integration of **Silicon** (ULIS 2002), accepted.

(11.) Z.K. Tang, et al., Science, 292, 2462, 2001.

(12.) P...

28/3,K/6 (Item 2 from file: 16)

DIALOG(R)File 16:Gale Group PROMT(R)

09410480 Supplier Number: 82478479 (USE FORMAT 7 FOR FULLTEXT)

Buckyballs stretch out in nanotubes : **conductive** polymers , **super magnets and optical materials are envisioned. (Newsfront).**

Ondrey, Gerald; Kamiya, Takeshi; Hairston, Deborah

Chemical Engineering, v109, n1, p41(2)

Jan, 2002

Language: English Record Type: Fulltext

Document Type: Magazine/Journal; Refereed; Trade

Word Count: 1148

(USE FORMAT 7 FOR FULLTEXT)

Buckyballs stretch out in nanotubes : **conductive** polymers , **super magnets and optical materials are envisioned. (Newsfront).**

TEXT:

When is a **carbon** **nanotube** not a buckytube? This may sound like a minor question of semantics, but for companies...

... their roots to buckyballs, or fullerenes, which are cage-like molecules of 60 or more **carbon** atoms. In the 17 years since the discovery of buckyballs, several processes for making them have been developed. Some enhance the properties of buckyballs by combining them with other **carbon** molecules and elongating the material into a cylindrical structure, called a buckytube. Researchers generally define buckytubes as single-wall hollow **carbon** tubes about 1 nm in dia. The cylinder is capped at one or both ends by a hemispherical half of a buckyball.

The industry debate centers on whether **carbon** nanotubes (figure, right), which can also be produced in double- or multiple-wall configurations, are...

...opinion, a pure buckytube ends at the single-wall configuration. After that, it becomes a **carbon** nanotube," he says. "However, because double walls and some multiwalls are closed at the end and have some pentagons (**carbon** structures), one might argue that they are still buckytubes," he explains. "On the other hand...

...that have open ends and no pentagonal structures. In the purest terms, these would be **carbon** nanotubes."

Carbon nanotubes are an extension of buckytubes, but not every **carbon** nanotube will have a buckytube's "perfect **carbon** structure," says Richard Smalley, a chemistry professor at Rice University, who shared the 1996 Nobel...

...or has a gap in its side is "dramatically weakened," says Smalley, who recently founded **Carbon** Nanotechnologies, Inc. (CNI; Houston, Tex.; cnanotech.com). "The `incredible properties' of **carbon** nanotubes are `most incredible' when you have a perfect **carbon** . That is the fullerene ideal."

A world of possibilities

Carbon nanotubes are highly efficient conductors of electricity and heat, and have a tensile strength 100...

...of steel). Such properties have potential application in flat-panel displays, high-strength cable, conductive **polymers** and composite materials. Until now, production methods have been limited to minute quantities, making **carbon** nanotubes prohibitively expensive.

Prices are expected to come down, as production is scaled up. For...

...HiPco process, licensed by Rice University. In the process, a gasphase catalyst precursor of transition **metals** is injected into **carbon** monoxide at about 100 bars pressure and nearly 1,000 (degrees) C.

MER, meanwhile, has a patent pending for double-wall **carbon** nanotubes. Analysis quantities of the material are being produced now and plans are to scale...

...process.

Japan is racing ahead

Japan is a bustling hub of activity, as commercialization of **carbon** nanotubes is proceeding on several fronts. Showa Denko K.K. (Tokyo) has developed a process to make vapor-grown **carbon** nanofibers (VGNF) with diameters of 80 nm. The material, which enters the market this month...

...nm-dia. nanotubes, also has capacity for 40 m.t./yr of 150-nm-dia. **carbon** fibers.

The new VGNF material is said to have better electrical and thermal conductivity and...

...phase process under development by Nikkiso Co. (Tokyo; nikkiso.co.jp), allows continuous production of **carbon** nanotubes. In the process, a proprietary organometallic catalyst is dissolved in an hydrocarbon solvent.

A...

...heated to 1,200 (degrees) C at 1 bar, causing the solvent to decompose into **carbon** . The **carbon** grows on the catalyst in the vapor phase to form tubes (CE, December 2001, p...

...and Mitsubishi Chemical Corp. (MCC; Tokyo; m.kagaku.co.jp) established a joint venture, Frontier **Carbon** Co. (FCC; Tokyo;), to mass produce fullerenes. FCC will use the basic material patent for...

...separation process and process engineering technology.

MCC has developed a continuous process -- based on its **carbon** black process -- to make

COMPANY NAMES: **Carbon** Nanotechnologies Inc.

28/3,K/7 (Item 3 from file: 16)

DIALOG(R)File 16:Gale Group PROMT(R)

09077906 Supplier Number: 79131161 (USE FORMAT 7 FOR FULLTEXT)

Researchers see big performance gain over back-gate field-effect transistors -- IBM demonstrates top-gate nanotube **FETs.(IBM)**

Kallender, Paul

Electronic Engineering Times, p59

Oct 15, 2001

Language: English Record Type: Fulltext

Document Type: Magazine/Journal; Trade

Word Count: 908

(USE FORMAT 7 FOR FULLTEXT)

Researchers see big performance gain over back-gate field-effect transistors -- IBM demonstrates top-gate nanotube **FETs.(IBM)**

TEXT:

Tsukuba, Japan - IBM Corp. has manufactured a top-gate **carbon** **nanotube** field-effect transistor, a key breakthrough for post- **silicon** circuit design, a leading researcher told the recent **Nanotube** Symposium here.

... to develop nanometer-scale magnets.

IBM's device places an independent gate just above a **carbon** nanotube that connects the source and drain, potentially yielding "more than one order of magnitude better performance" than back-gate **carbon** nanotube FETs, said Phaedon Avouris, manager of nanometer-scale science and technology at IBM.

IBM has already achieved results comparable to traditional **silicon** dioxide FETs with its recently developed p- and n-type **carbon** nanotube FETs, where the gate and nanotubes are separated by about 150 nanometers. IBM's...

...Yorktown Heights, N.Y., will now work to bring down the gap for top-gate **carbon** nanotube FETs to 2 nm, increasing the performance exponentially and fulfilling the promise of **carbon** nanotubes as a nanoscale replacement for **silicon** circuits.

"The game is to get to 2 nm, and we're going down. The devices we have now compare well with **silicon** dioxide, and that's at 150 nm. Wait until we get to 2 (nm)," Avouris...

...research lab said it had integrated molecular-scale logic circuits mixing p- and n-type **carbon** nanotube FETs along **carbon** nanotubes to form logic gate voltage inverters. Until that achievement, researchers had succeeded in developing arrays of only p-type **carbon** nanotube FETs. IBM researchers found that by annealing normal p-type **carbon** nanotube FETs in a vacuum, they could manufacture p-type, n-type and ambipolar **carbon** nanotube FETs to form complementary intermolecular logic gates.

In other words, they had created nanoscale...

...IBM's breakthroughs bolstered an upbeat conference that sought to map out the potential of **carbon** nanotube technology.

Reviewing the decade, Leo Esaki of the Science Academy of Tsukuba pointed to...

...including Atsushi Oshiyama predicted nanotubes could act as semiconductors. That year, 1992, the first multiwalled **carbon** nanotubes were made. Single-walled-tube manufacture followed in 1993. Basic electrical properties were figured...

...were first produced in 1998. Since then, researchers have found they can stuff nanotubes with **Carbon** 60 and other molecules to form complex structures.

Nanotube billionaires

Over the next decade, **carbon** nanotubes could produce a clutch of "billionaires" among those who develop key device breakthroughs, and...

...the 2010s, Esaki said. Japan is on the verge of developing a nanotechnology industry, with **carbon** nanotubes, or CNTs, as a key weapon.

After reviewing his discovery, Iijima said **carbon** nanohorns were the next frontier for developing nanobatteries with up to 10 times the capacitance...

...lithium-ion batteries. Iijima stumbled across the horns in 1999 in a vapor trail of **carbon** shot with a **carbon** dioxide laser. Jutting from globules, the horns guzzle gasses and are easy to make at...

...Tsukuba, challenged researchers to confirm two new theories that could again help revolutionize electronics: that **carbon** nanotubes can be made

into nanomagnets and that today's basic **carbon** nanotube "peapods"-devices with **carbon** 60 molecules-are one-dimensional **metals** that can be made into superconductor wires.

Researchers now understand that breaking off the tips of **carbon** nanotubes disturbs the electron spin balance that normally exists through the body of the tube...

...in a controllable way and then move to develop magnets, he said.

"If we manipulate **carbon** correctly, we can make **carbon** magnets," he said. "How soon can it be confirmed? Within a year or within a...

...of that, Steven Louie of the University of California at Berkeley said his studies of **carbon** -boron-nitrogen nanotubes and peapods confirmed that nanotubes could be made into quantum wires. Berkeley has made Schottky barriers by adding defects in **carbon** nanotubes, considerably altering their conductance. That property, he said, could lead to "on-tube" junction ...

28/3,K/8 (Item 4 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

08456698 Supplier Number: 72271918 (USE FORMAT 7 FOR FULLTEXT)
BN nanostructures prove stronger, lighter than steel.(Technology Information)
Johnson, R. Colin
Electronic Engineering Times, p88
March 26, 2001
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 765

(USE FORMAT 7 FOR FULLTEXT)
TEXT:
Evanston, ILL. - Northwestern University research has delivered the world's first **nanotubes** , -cones and -spheres constructed from boron nitride rather than the usual **carbon** . Single-walled boron-nitride (BN) nanostructures are hypothetically stronger and lighter than steel, but were only recently demonstrated here by professor Laurence Marks. Once BN nanostructures are embedded into **polymers** , they could serve to ruggedize the surface of metal parts, as well as form the...
... durable materials that have better electronic qualities and are much easier to work with than **carbon** nanostructures."

Carbon nanostructures, such as the 60-molecule spheres known as buckyballs, have found wide technological uses...

...proof coatings that are lighter but stronger than steel.

BN nanostructures have been hypothesized since **carbon** buckyballs were first built in the 1980s. But previous evidence of BN nanostructures was limited...

...and nitrogen are broken by the occasional fourfold and eightfold rings that enable them to **bend** into distinct shapes. **Carbon** nanotubes, on the other hand, are primarily hexagons with occasional fivefold and sevenfold rings. That...

...future, the researchers hope to extend their technique to another world first: direct deposition of **carbon** nitride nanostructures, which are hypothesized to have extensive electronic applications.

http://www.eetimes.com/

Copyright...

28/3,K/9 (Item 5 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

08415364 Supplier Number: 71579296 (USE FORMAT 7 FOR FULLTEXT)
MEASURING THE TINIEST STRUCTURES.
DeGaspari, John
Mechanical Engineering-CIME, v123, n1, p27
Jan, 2001
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Refereed; Trade
Word Count: 527

(USE FORMAT 7 FOR FULLTEXT)
TEXT:
...the Georgia Institute of Technology in Atlanta have developed a technique to measure the comparative **bending** strength of individual **carbon nanotubes** produced by two competing processes. The technique characterizes **nanotubes** produced by traditional high-temperature **carbon** arc discharge and **nanotubes** grown at a lower temperature by catalyst-assisted pyrolysis.
... induced by an oscillating electrical voltage in a transmission electron microscope to measure the comparative **bending** strength of the tiny **carbon** tubes.
Strength measurements could be correlated to observed point defects, which could help materials scientists...

...Center for Nanoscience and Nanotechnology. The high strength, light weight, and conductive properties of multiwalled **carbon** nanotubes make them candidates for applications as diverse as ultralight composites and low-power field emission displays. Both catalytically grown tubes and **carbon** arcs have unique advantages. Catalytically grown nanotubes may offer advantages for ultralightweight composites, in which...

...knowing the outer diameter, inner diameter, length, and density of the nanotube under study, the **bending** modulus can be determined from the frequency at which the tube resonates. The oscillation can...

...said the technique can be applied to any fibers or wire-like materials, such as **silicon** and SiC nanowires, for mechanical property measurements. He said the measurement technique can improve theoretical...

...believes that the technique could be an advantage in space technology, where composites reinforced with **carbon** nanotubes can reduce weight by a factor of five to 10, while increasing the strength by the same factor compared to a conventional **carbon** fiber matrix.

28/3,K/10 (Item 6 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

08325032 Supplier Number: 70386058 (USE FORMAT 7 FOR FULLTEXT)
Future fillers could include fullerenes, `smart' materials.(Brief Article)
Davis, Bruce
Rubber & Plastics News, v22, n9, p5
Feb 12, 2001
Language: English Record Type: Fulltext
Article Type: Brief Article
Document Type: Magazine/Journal; Trade
Word Count: 344

(USE FORMAT 7 FOR FULLTEXT)
TEXT:
Forget **carbon** black and silica. When it comes to creating cutting-edge rubber compounds for tomorrow's tires, think biofillers, fullerenes, **nanotubes** , nanostructured chemicals or other "smart" materials. These structures potentially could be the functional fillers of...

...scientific knowledge of the filler mechanism itself, Mowdood said. Fullerenes are a form of pure **carbon** --comprised entirely of hybridized carbons, arranged in hexagons and pentagons--that are considered the only molecular **carbon** , Mowdood said. A fullerene network forms a molecule with a cage-like structure--resembling either...

...fixation. They have been used in experiments to modify the viscoelastic properties of diene-based **polymers** , Mowdood said. The most symmetrical of these structures is the "Buckminster" fullerene, named after the geodesic dome designed by the architect Buckminster Fuller. **Nanotubes** are closed single- or **multiwalled** cylinders of **carbon** atoms. The low specific gravity and high surface reactivity of **nanotubes** could be a highly reinforcing filler for tire compounds, Mowdood said. On a more practical basis, tire makers are experimenting not only with new modified **carbon** blacks and silicas, but also are looking at:
PRODUCT NAMES: 2895000 (**Carbon** Black); 3011000 (Tires); 2869330 (Rubber Processing Chemicals); 2821060 (Engineering Plastics)
SIC CODES: 2895 (**Carbon** black); 3011 (Tires and inner tubes); 2869 (Industrial organic chemicals, not elsewhere classified); 2821 (Plastics ...
)
NAICS CODES: 325182 (**Carbon** Black Manufacturing); 326211 (Tire Manufacturing (except Retreading)); 325199 (All Other Basic Organic Chemical Manufacturing); 325211...
)

28/3,K/11 (Item 7 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

08271623 Supplier Number: 69712842 (USE FORMAT 7 FOR FULLTEXT)
gamma)-junction carbon nanotubes **behave like electronic devices at room temperature.(Brief Article)**
Burggraaf, Pieter
Solid State Technology, v44, n1, p32
Jan, 2001
Language: English Record Type: Fulltext
Article Type: Brief Article
Document Type: Magazine/Journal; Refereed; Trade
Word Count: 578

gamma)-junction carbon nanotubes **behave like electronic devices at room temperature.(Brief Article)**
A professor at Brown University, Providence, RI, believes (gamma)-junction **carbon** nanotubes may play a future role as a viable alternative beyond the limits of today's **silicon** technology.
Jimmy Xu with Brown University's division of engineering, explains, "Today's p-n...

...is to achieve similar functionality at the nanometer scale." Xu's work is focusing on **carbon** nanotubes (CNTs) for molecular-scale devices (see illustration).
CNT structures can be synthesized by arc...
PRODUCT NAMES: 2819510 (**Silicon**)

28/3,K/12 **(Item 8 from file: 16)**
DIALOG(R)File 16:Gale Group PROMT(R)

08175596 Supplier Number: 68546434 (USE FORMAT 7 FOR FULLTEXT)
MEASURING THE TINIEST OF STRUCTURES: RESEARCHERS COMPARE BENDING **STRENGTH OF INDIVIDUAL** CARBON NANOTUBES .
Advanced Materials & Composites News, v23, n507, pNA
Jan 2, 2001
Language: English Record Type: Fulltext
Document Type: Newsletter; Trade
Word Count: 857

(USE FORMAT 7 FOR FULLTEXT)
MEASURING THE TINIEST OF STRUCTURES: RESEARCHERS COMPARE BENDING **STRENGTH OF INDIVIDUAL** CARBON NANOTUBES .
TEXT:
...technique based on mechanical resonance induced by an oscillating electrical voltage to measure the comparative **bending** strength of tiny **carbon nanotubes** produced by two competing processes.
... applications now under development. The high strength, light weight and unique electronic properties of multiwalled **carbon** nanotubes have led to potential applications as diverse as ultra-light composites and low-power...
...able to make a quantitative comparison, with a real number to describe how much the **bending** modulus differs," said Dr. Z.L. Wang, a Georgia Tech professor of materials science. "This...

...University of Science and Technology in Beijing, Wang compared nanotubes produced by traditional high-temperature **carbon** arc discharge to nanotubes grown through a lower-temperature catalyst-assisted pyrolysis process. In the...

...Researchers had known that the catalytically-grown tubes were weaker than comparable structures grown in **carbon** arcs, and had made bulk measurements that produced an average strength value. But producing data ...

...can be "grown like grass on a substrate," and the relatively low yield of the **carbon** arc method, Wang noted. "Both types have advantages depending on the specific application," he noted...

...inner diameter, length and density of the nanotube under study, the researchers can determine the **bending** modulus from the frequency at which the tube resonates. Because the oscillating tube can be...
...wide application as a general technique for making mechanical property measurements of any nanofibers."
Because **carbon** nanotubes are so light and strong, they could offer significant advantages over conventional **carbon** fiber reinforcement in the manufacture of some composite materials. They also are of interest for ...

...of hydrogen.
"This could be a big gain for space technology," Wang said. "In composites, **carbon** nanotubes can reduce weight by a factor of 5-10, while increasing the strength by a factor of 5-10 compared to a conventional **carbon** fiber matrix."
Beyond the **carbon** nanotubes, Georgia Tech researchers have used the TEM technique to measure the properties of biaxially structured **silicon** carbide-silica nanowires.
In a paper accepted for publication in Applied Physics Letters, J.L ...

...modulus of a single fiber produced by growing two different materials together. These biaxially structured **silicon** carbide-silica nanowires could have important applications in nanoelectronics and high-strength composites.
The measurements...

28/3,K/13 (Item 9 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

07155384 Supplier Number: 60970451 (USE FORMAT 7 FOR FULLTEXT)
ENERGY STORAGE: Nanofibers Boost Capacitor Performance.(Brief Article)
Battery & EV Technology, v24, n11, pNA
March, 2000
Language: English Record Type: Fulltext
Article Type: Brief Article
Document Type: Newsletter; Trade
Word Count: 486

(USE FORMAT 7 FOR FULLTEXT)
TEXT:
...450 m2/g), narrow pore size distribution (9 to 25 nanometers), and negligible micropores. The **nanotubes** also have controllable density (0.4 to 1.1 g/cc) and good conductivity (10-2 to 10-3 (-cm). The robust **carbon** fibrils need no binders and have a tensile strength of 700 psi, according to Hyperion...
The Tenfil nanotubes are hollow, multilayered, graphitic **carbon** tubes, with a diameter of 0.008 to 0.015 micron and a length ranging from 10 to 15 microns. The **carbon** nanofibers are 1,000 times smaller in diameter than traditional **carbon** fibers. Fibril-based compounds, notes Collins, offer a significant reduction in particle generation and contamination...

...process, says Collins. Buckytubes are singlewalled, straight, grown from arc discharge or lasers using solid **carbon** , she says. The buckytube production is low yield, difficult to purify and to scale up...

...a thin coating layer of a pyrolyzed carbonaceous polymer, which modifies the Faradaic capacitance. Suitable **polymers** include phenolics-formaldehyde, polyacrylonitrile, styrene DVB, cellulosic **polymers** , and H-resin.
The nanofibers may be intertwined and interconnected to form a rigid porous **carbon** structure. The structure, granted U.S. Patent 6,031,711, is used to make either...

...the surfaces of the two electrodes.
Tenel electrodes offer advantages over ones composed of activated **carbon** , Collins explains. The **carbon** nanofiber-based electrodes have an ideal pore structure, which gives them consistent, controllable physical properties...

28/3,K/14 (Item 10 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

05804948 Supplier Number: 50297736 (USE FORMAT 7 FOR FULLTEXT)
A CASE FOR EVER-SMALLER ELECTRONICS
TERESKO, JOHN
Industry Week, v247, n16, p31
Sept 7, 1998

Language: English   Record Type: Fulltext
Article Type: Article
Document Type: Magazine/Journal; Trade
Word Count: 125

(USE FORMAT 7 FOR FULLTEXT)
TEXT:
...phenomenon in which electrons pass through a conductor without heating it-at room temperature in **multiwalled carbon nanotubes** up to five microns long. "This is the first time that ballistic conductance has been ...

28/3,K/15 (Item 11 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

02899765 Supplier Number: 43913653
CARBON NANOTUBES : **Recipes found for simplest variety**
Chemical & Engineering News, p6
June 21, 1993
Language: English   Record Type: Abstract
Document Type: Magazine/Journal; Refereed; Academic

CARBON NANOTUBES : **Recipes found for simplest variety**

ABSTRACT:
Japanese and California researchers have discovered 2 recipes for preparing single-wall **carbon** nanotubes, an all- **carbon** structure that may have significant electronic and mechanical properties. **Carbon** nanotubes--hollow, nanometer-wide tubles of graphite-like **carbon** --were first discovered by Sumio Iijima of NEC in 1991. His nanotubes consisted of two...

...published a paper in Nature describing how to make single-layer nanotubes by vaporizing a **carbon** electrode in the presence of iron vapor, methane and and argon. Donald S Bethune et...
...s Almaden Research Center in San Jose, CA, reported similar results in Nature by covaporizing **carbon** and cobalt in a helium-filled arc generator. Both groups ascribe a catalytic role to...

...before his own discovery of multiwalled nanotubes. The IBM group was trying to wrap a **carbon** cage around a single magnetic atom or nanocrystal. The nanotubes produced by both groups are...

28/3,K/16 (Item 1 from file: 20)
DIALOG(R)File 20:Dialog Global Reporter

20965719 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Dr. Sumio Iijima Awarded Benjamin Franklin Medal in Physics
PR NEWSWIRE
January 28, 2002
JOURNAL CODE: WPRW   LANGUAGE: English   RECORD TYPE: FULLTEXT
WORD COUNT: 751

(USE FORMAT 7 OR 9 FOR FULLTEXT)

...field of Physics for "his discovery and clarification of the atomic structure and character of **multi - wall** and single-wall **carbon nanotubes** *, which have critically shaped the rapidly growing condensed matter and materials science field of nanoscale...

... Akira Tonomura, who received the award in 1961, 1990 and 1999, respectively.
"The discovery of **carbon** nanotubes has cultivated new fields from fundamental material science technology to practical applications," said Dr ...

... Technology Corporation (ICORP/JST). He also serves as Director of the Research Center for Advanced **Carbon** Materials of National Institute of Advanced Industrial Science and Technology (AIST).
Recently, the European Physical...

...Dekker, Thomas Ebbesen and Paul L. McEuen for the discovery of multi and single walled **carbon** nanotubes and pioneering studies. The American Physical Society (APS) has also selected Dr. Iijima and...

... James C. McGroddy Prize for New Materials for the discovery and development of single-wall **carbon** nanotubes. Award ceremonies for both prizes will be held at the EPS and APS Meetings...

... which will become seeds for future technology, and contribute to the advancement of society.
*About **Carbon** Nanotube
Using a transmission electron microscope Dr. Sumio Iijima discovered from inside the **carbon** electrode after arc discharge, the **carbon** nanotube, a new **carbon** material, in 1991. The **carbon** nanotube has a tubular structure with a nanometer-scale diameter (1-dimensional structure), and is the 4th **carbon** form following graphite (2-dimensional structure), diamond (3-dimensional structure), and **carbon** 60 (C60: 0-dimensional structure).
Dr. Iijima clarified mechanisms of growth and **bending** of nanotubes, found metal incorporation into nanotubes, and grew single-wall **carbon** nanotubes. These studies created a global research boom in the field of **carbon** nanotechnology
The **carbon** nanotube has not been limited to scientific research, but also, its industrial application research has been briskly undertaken since the **carbon** nanotube discovery, due to its unique structure and physical properties. Especially, the possibility as an...

... panel display industry and in the future, because of its crystal completeness and miniature structure, **carbon** nanotube technology is expected to be applied to fuel cells, catalysts, absorbents, sensors, STM probes...

28/3,K/17 (Item 1 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

14276065 SUPPLIER NUMBER: 82659754 (USE FORMAT 7 OR 9 FOR FULL TEXT)
NEC nanotube **discoverer named for Franklin medal.**
Reynolds, Melanie
Electronics Weekly, 14
Feb 6, 2002
ISSN: 0013-5224 LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 90 LINE COUNT: 00010

NEC nanotube **discoverer named for Franklin medal.**
... discovery and clarification of the atomic structure and character of multi-wall and single-wall **carbon** nanotubes (pictured above).
The **carbon** nanotube has attracted attention due to its possibility as an efficient electron source. It is...

28/3,K/18 (Item 2 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

10504670 SUPPLIER NUMBER: 21188463 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Ballistic conductance observed in carbon nanotubes .
Burgraaf, Pieter
Solid State Technology, v41, n9, p34(1)
Sept, 1998
ISSN: 0038-111X LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 608 LINE COUNT: 00052

Ballistic conductance observed in carbon nanotubes .

TEXT:
...pass through a conductor without heating it. The observation was made at room temperature in **multiwalled carbon nanotubes** up to 5 ((micro)meter) long. Walter de Heer, a professor in Georgia Tech's...
... that electronic devices using nanotube conductors are perhaps decades away. One fundamental issue is that **carbon** materials are incompatible with **silicon** , the basis of current ICs. Solving that challenge will require a revolution in electronic design. "It would be like introducing **silicon** transistors during the age of vacuum tubes," he said. "You couldn't combine the two...

28/3,K/19 (Item 1 from file: 583)
DIALOG(R)File 583:Gale Group Globalbase(TM)

09700118
Mitsui & Co to Build 120-t/y **Carbon Nanotube** Plant
Japan: M&C's unit to build **carbon nanotube** plant
Japan Chemical Week (JCW) 10 Jan 2002 p.7
Language: ENGLISH

Mitsui & Co to Build 120-t/y **Carbon Nanotube** Plant
Japan: M&C's unit to build **carbon nanotube** plant

In Japan, a unit of Mitsuo & Co (M&C), **Carbon** Nanotech Research Institute (CNRI) will construct the biggest **carbon** nanotube production plant in the world in Akishima City, Tokyo in April 2002. The plant...

31/3,K/1 (Item 1 from file: 20)
DIALOG(R)File 20:Dialog Global Reporter

22604747 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Slow train to safety on the UK's railways
ELECTRONIC ENGINEERING TIMES UK
January 21, 2002
JOURNAL CODE: FETS LANGUAGE: English RECORD TYPE: FULLTEXT
WORD COUNT: 24255

(USE FORMAT 7 OR 9 FOR FULLTEXT)

... 050:Carbon **nanotubes** to improve solar cells...

... University's engineering department have developed photovoltaic devices that, when doped with single-wall carbon **nanotubes** (SWNTs), perform better than undoped devices.

The **nanotube** diodes were made by depositing organic films containing SWNTs on to glass substrates coated with...

...under a vacuum to form a sandwich configuration (see diagram).

The interaction of the carbon **nanotubes** with the polymer poly(3-octylthiophene) (P3OT) allows excitons generated by light in the polymer ...

... work, said: "The operating principle of this device is that the interaction of the carbon **nanotubes** with the polymer allows charge separation of the photogenerated excitons in the polymer and efficient electron transport to the electrode through the **nanotubes** .

"The electrons travel through the **nanotube** length and then hop or tunnel to the next **nanotube** ."

This results in an increase in the electron mobility and balances the charge carrier transport...

...acceptors, (such as C60 `buckyballs').

"Furthermore, we will try to increase the absorption in the **nanotube** - polymer junction by incorporating an organic dye."

As far as an industrial scale process goes...of making sure that the program is correct; the values used to tune a control **loop** are as important. That calls for the ability to programme memory values on-the-fly ...number of additional features beyond those in 500K. They include support for multiple phase-locked **loops** (PLLs) and up to 198Kbit of dual-port embedded SRAM.

The Plus chips have two... a 7 x 7mm package. The amplifier will support use in an open or closed **loop** circuit. Volume production is planned for the first half of 2002.

Agilent Technologies has put...controlled through the host computer's user interface or using a preprogrammed script. The computer **hooks** up through USB or a serial port.

Tel +47 22 10 60 90

www.vmetro...

33/3,K/1 (Item 1 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

11789767 SUPPLIER NUMBER: 58576951 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Product Locator.
Appliance Manufacturer, 47, 12, PL-1
Dec, 1999
ISSN: 0003-679X LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 35331 LINE COUNT: 08942

... Dearborn Screw & Bolt Co.
Engineered Fastener Co., Corporate Headquarters
Fastbolt Corp.
Fastener Products, Inc.
Industrial **Fasteners** Corp., North Roslyn Park
(*) K-Tech Mfg.
Meaco Products Corp.
Metric Bolt & Nut Co., Inc...Technologies
GE, Control Products
GE Co., GE Business Information Center
GE Motors & Industrial Systems
Honeywell, **Micro** Switch Div.
IEE
Intellon Corp.
Invensys Appliance Controls, Cooking and Refrigeration Systems Division
Invensys Appliance...

37/3,K/1 (Item 1 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

05592946 SUPPLIER NUMBER: 12399671 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Manufacturers. (laser industry) (The 1992 Buyers Guide) (Directory)
Laser Focus World, v27, nSPEISS, p746(155)
Dec 15, 1991
DOCUMENT TYPE: Directory ISSN: 0740-2511 LANGUAGE: ENGLISH
RECORD TYPE: FULLTEXT
WORD COUNT: 139277 LINE COUNT: 11434

... 1986 Development of fiberoptic material and devices, custom dimensioned tubing, submillimeter rod and prisms for **micro** -optic and window applications. Products available in most optical and filter glasses.
Drews Optical Inc...

43/9/1 (Item 1 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

01579147 02-30136
IBM scientists bend **them, shape them, any way they want to**
Jacoby, Mitch
Chemical & Engineering News v76n7 PP: 4-5 Feb 16, 1998 ISSN: 0009-2347
JRNL CODE: CEN
DOC TYPE: Journal article LANGUAGE: English LENGTH: 2 Pages

ABSTRACT: In a display of unprecedented dexterity, IBM scientists have demonstrated the ability to reshape, move, and cut - at will - individual **multiwalled** carbon nanotubes on a solid surface. The ability to manipulate the tubes with nanometer-scale agility may hasten the ongoing trend toward miniaturization of electronic devices.

COMPANY NAMES:
IBM Corp (DUNS:00-136-8083 TICKER:IBM)
GEOGRAPHIC NAMES: US

DESCRIPTORS: Nanotechnology; Microelectronics; R&D; Scientists; Manipulation
CLASSIFICATION CODES: 9190 (CN=United States); 5400 (CN=Research & development); 8650 (CN=Electrical & electronics industries); 9000 (CN=Short Article)

46/3,K/1 (Item 1 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

06982163 Supplier Number: 58322595 (USE FORMAT 7 FOR FULLTEXT)
Nano-tweezers make a grab for individual atoms.
Electronics Times, p18
Dec 13, 1999
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 295

... of Harvard and Charles Lieber of Berkeley have done just that.
They attached two carbon **nanotubes** to either side of a pulled glass micropipette. Applying a voltage to the **nanotubes** causes them to open and close. Because the **nanotube** arms can conduct electricity, they can also be used to probe the electrical properties of...

...from an entangled sample showed the power of the tweezers.
The GaAs nanowires exhibited highly **non - linear** I-V behaviour that is characteristic of tunnelling through a barrier. This behaviour was consistent...

...These are limited by their large size and large actuating voltages. Kim and Lieber used **nanotubes** with 100nm diameters.

46/3,K/2 (Item 2 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

06963294 Supplier Number: 58342562 (USE FORMAT 7 FOR FULLTEXT)
Manufacturers and Suppliers.(Alphabetical list of companies)
Lasers & Optronics, v18, n11, pS8
Nov, 1999
Language: English Record Type: Fulltext
Document Type: Tabloid; Academic Trade
Word Count: 71777

... GWU manufactures OPOs ((micro)s, ps, and fs), frequency converters, color center lasers and distributes **non - linear** and laser crystals as well as Echelle spectrographs.

H

Haas Laser Technologies Inc., 37 Ironia...sub.2), YAG and excimer applications. Capabilities include fabrication of flats, spherical radii, cylindrical radii, **non - linear** crystals.

Lambda Research Corporation, 80 Taylor St., Littleton, MA 01460;
Phone: 978/486-0766, Fax...manufacturer of nano-sized metal, ceramic, composite and fullerene powders (coarse, fine, ultrafine, nanoparticles, nanocrystals, **nanotubes** and nanowires).

Nanolase, 31 Chemin du Vieux Chene, Zirst 4101, 38941 Meylan, France;
Phone: <33...filters, collimators, alignment devices, beam expanders/directors, optical tables, benches, breadboards, hardware, light shields, etc.

Non - Linear Devices, 126 Andrew Ave., Oakland, NJ 07436;
Phone: 201/337-0666, Fax: 201/337-5237
Martin Phillips;
3 Employees; 2 Engineers; Established: 1974
Non - Linear Devices is an electro-optical and fiberoptic manufacturers' representative company for the states of New...Onyx Optics, Inc. produces composites with YAG, GSGG, YLF, sapphire or other laser hosts, or **non - linear** crystals, without adhesives, in configurations

designed by our customers.
OPCO Laboratory, Inc., 704 River St...

46/3,K/3 (Item 1 from file: 20)
DIALOG(R)File 20:Dialog Global Reporter

21446116 (USE FORMAT 7 OR 9 FOR FULLTEXT)
21st century technology - Atomic smitten.
COMPUTER RESELLER NEWS, p29
February 25, 2002
JOURNAL CODE: WPCD LANGUAGE: English RECORD TYPE: FULLTEXT
WORD COUNT: 1918

(USE FORMAT 7 OR 9 FOR FULLTEXT)

... integrated circuits."
Roberson adds that the molecular components currently studied at Motorola Labs include carbon **nanotubes** with diameters as small as one nanometre, and custom-synthesised organic molecules. He says the carbon **nanotubes** have been shown to exhibit electrical properties similar to that of conventional silicon-based components. However, the custom molecules show highly **non - linear** current-voltage characteristics such as negative differential resistances.
Roberson claims research suggests that with further...

46/3,K/4 (Item 2 from file: 20)
DIALOG(R)File 20:Dialog Global Reporter

11520025 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Fullerene and its future prospects
SECTION TITLE: Product Profile
Anil Srivastava, Sanjay Chauhan, Rajender Sandhu & Vilakshan Singh, Department of Chemical Technology, Sant Longowal Institute of Engineering and Technology, Longowal - 148 106, India.
CHEMICAL BUSINESS
May 31, 2000
JOURNAL CODE: WCLB LANGUAGE: English RECORD TYPE: FULLTEXT
WORD COUNT: 1797

(USE FORMAT 7 OR 9 FOR FULLTEXT)

... a sphere, inside and outside. From the outside, the closed carbon cage of fullerene and **nanotubes** are potential building block for chemistry and technology, but from the inside, these carbon structures...
... Diphenyl diazo methane based compound of C60 have been reported to be used as catalyst, **non - linear** optical or ferroelectric material, transport agents for refractory or reactive species, photosensitizer, electronic and magnetic...